THE Journal OF THE

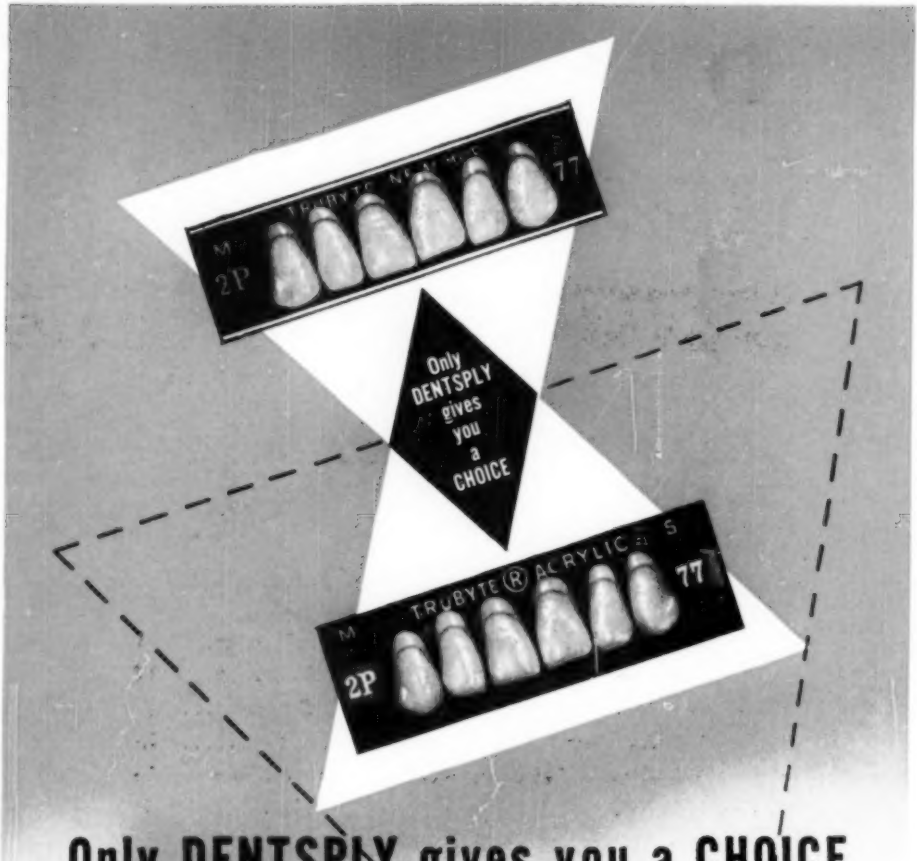
AMERICAN DENTAL ASSOCIATION

JANUARY 1950 • VOLUME 40 • NUMBER 1

CONTENTS

Oral Treponemes and Borrelia Vincenti.....*Hampp*.... 1
Factors Retarding Ridge Resorption.....*Schlosser*.... 12
Elimination of Fatigue for the Dentist.....*Swanson*.... 19
Periodontal Membrane in Orthodontics.....*Moyers*.... 22
Periodontal Disease: Public Health Aspects..*Chilton*.... 28
Detection of Proximal Cavities.....*Trithart*.... 33
Evanston Dental Caries Study IV.....*Davies*.... 37
Dental Surveys and Congenital Syphilis.....*Bertram*.... 45
Precocious Alveolar Bone Destruction.....*Seidler*.... 49
Occlusion and Prosthetic Restorations.....*Collett*.... 59
Alginate Hydrocolloids: Bridge Technic.....*Pfeiffer*.... 66
Editorials 75
International Correspondence..... 79
News of Dentistry..... 84
The Reader Comments..... 98
Book Reviews..... 99
Reports of Councils.....104
Cases and Comments.....119
Current Literature.....123
Announcements 130

CONTRIBUTE TODAY TO THE A. D. A. RELIEF FUND



Only DENTSPLY gives you a CHOICE

of popular forms and shades*

in porcelain and plastic teeth

The best in their Class

TRUBYTE NEW HUE® TEETH

and

TRUBYTE® ACRYLIC TEETH

***Trubyte Acrylic Teeth are available in these Trubyte New Hue Shades:**

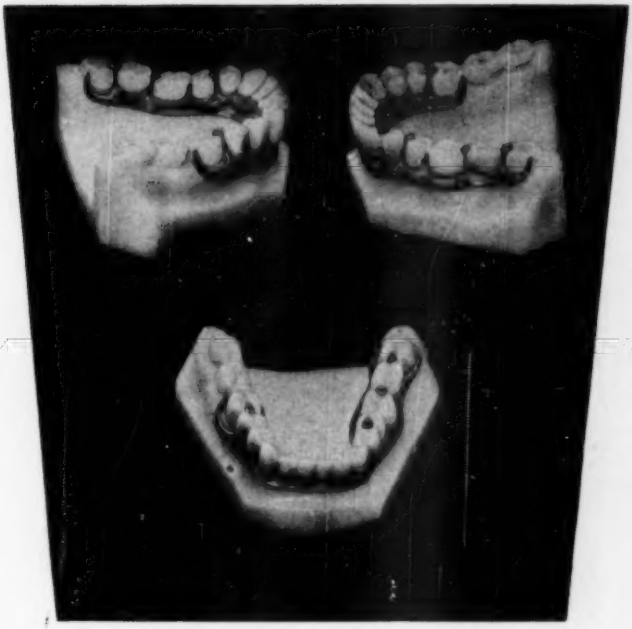
62, 65, 66, 67, 68, 69, 77 and 81.

THE DENTISTS' SUPPLY COMPANY OF NEW YORK

220 West 42nd Street, New York 18, New York

The Journal of the American Dental Association, Vol. 40, No. 1. Published by the American Dental Association, 222 E. Superior St., Chicago 11, Ill. Yearly subscription $7.00 for U. S. and possessions; $8.00 for foreign countries. Single copy seventy-five cents. Entered as second-class matter, December 31, 1947, at the postoffice at Chicago, Ill., under the act of March 3, 1879. Published monthly. Copyright 1950 by the American Dental Association. The Journal of the American Dental Association is indexed in the Index to Dental Literature and, in part, in the Quarterly Cumulative Index Medicus, Biological Abstracts and Chemical Abstracts.

DEE GOLD



Three views of a Roach design partial cast of DEEFOUR gold

EXPERIENCE PROVES THAT GOLD RESTORATIONS offer exceptional value and highly satisfactory service to you and to your patients.

Laboratories and dealers recognize quality and are glad when you specify DEE gold. Patients are better pleased with gold.

OFFICE AND PLANT
1900 WEST KINZIE STREET..

HANDY & HARMAN
DEE GOLD
PRECIOUS METALS

REFINERS & MFRS..
..CHICAGO, 22, ILLINOIS

The Compound Knife

you've been waiting for

Now it is possible to accurately trim compound impressions with this new Bard-Parker knife, especially designed for the purpose. The two-unit knife combines a palm-fitting plastic handle and a sturdy detachable blade which can be instantly replaced with a new, sharp blade when needed.

Ask your dealer for the new B-P Blade No. 25 . . . fits the popular B-P Plastic Handle No. 6.

PRICE

B-P Blade No. 25, per pkg. of 6 ..... 75c
B-P Plastic Handle No. 6 ..... $2.00

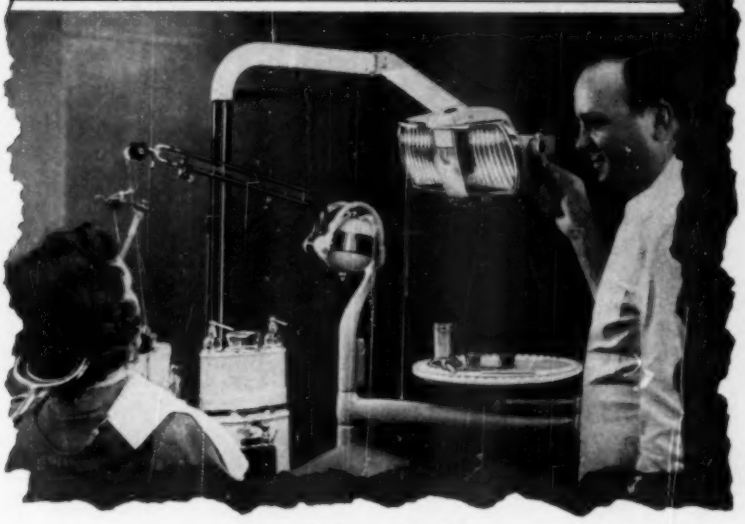
BARD-PARKER COMPANY, INC.
Danbury, Connecticut

B-P

A BARD-PARKER PRODUCT

1900 • PELTON'S GOLDEN JUBILEE • 1950

FRONT PAGE NEWS



The New Pelton

SIGHT-MASTER LIGHT

"BUY IT AND SEE"

Highlight of Pelton's Golden Jubilee is the new Sight-Master Light. Optically and mechanically it is the finest in Pelton's long experience in providing better vision for dentists. Sight-Master projects two converging beams of cool, color-corrected, shadowless light, enabling you to work in your normal operating position. Thus, Sight-Master reduces both eye strain and physical effort. It is low-cost protection for your most valuable asset . . . your eyes.

See it at your dealer's or write for literature.

PELTON

THE PELTON & CRANE CO., DETROIT 2, MICHIGAN

THE 1950 A. D. A. APPOINTMENT BOOK

IS NOW AVAILABLE

If you aren't already on the standing order list, send in your order today.

EXCLUSIVE FEATURES

- ★ **A full week's appointments at a glance**
- ★ **Patient recall system**
- ★ **Catalog of library books**
- ★ **Catalog of dental health educational literature**
- ★ **National holidays**
- ★ **List of acceptable local anesthetics**
- ★ **List of certified dental materials**

Use This Order Blank

American Dental Association
222 E. Superior Street
Chicago 11, Illinois

Check the order you wish to place:

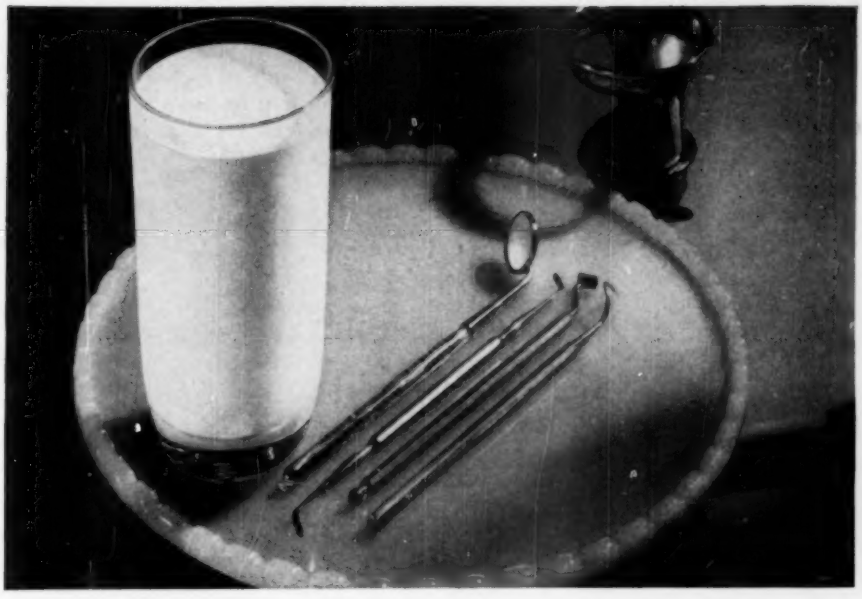
☐ Place my name on the standing order list to get the A.D.A. Appointment Book regularly each year beginning with the 1950 edition and bill me for $1.50. I understand this order is cancellable at any time.

☐ Just send me a copy of the 1950 book and bill me for $1.50.

Signed .....

..... No. Street

..... City Zone State



Tools for Dental Health... Research adds new chapter to story of fluid milk as a dietary aid for building sound teeth

RECENT research revealed that fluid milk in the diets of experimental animals was extremely effective in preventing dental caries, even when the diets included relatively large amounts of sugar . . . though animals fed the same fermentable sugars in dry rations were highly susceptible to caries.*

There are several possible explanations for this. For example, the fluidity of the milk is thought to be very important. Caries-inducing sugars may remain in the mouth longer when they are in a dry ration than when they are mixed with a liquid as with milk, or as in ice cream which melts quickly in the mouth. Also, scientists point out that fat exists in milk and ice cream in a relatively free condition, and it may form a protective coating on exposed tooth surfaces, or around the food particles.

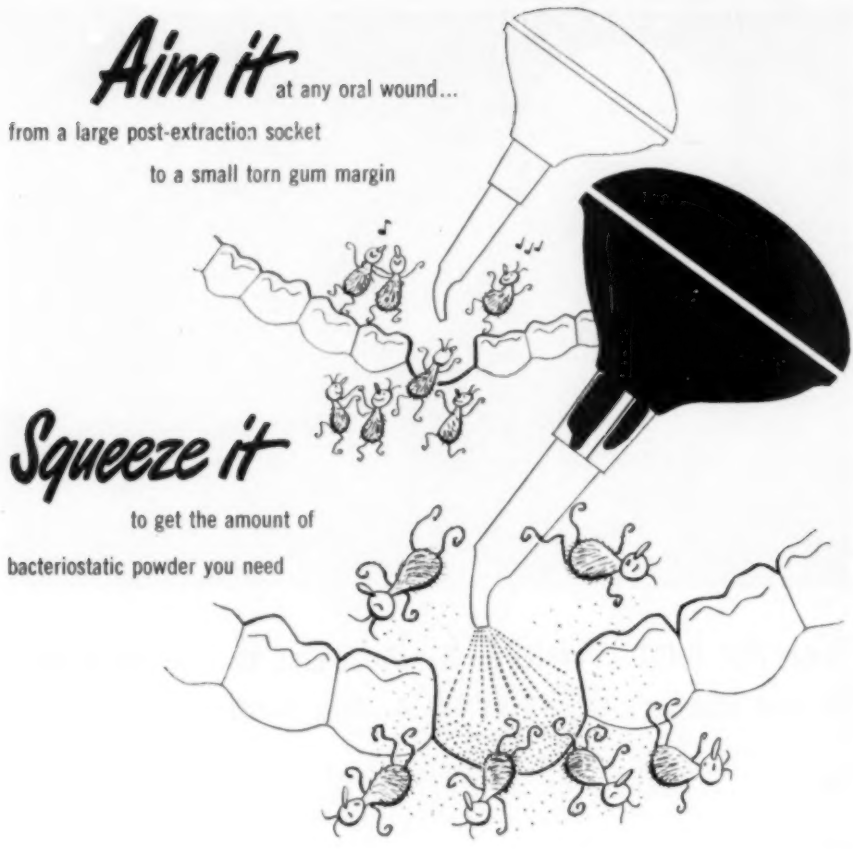
The conclusion is clear whatever the cause: Milk is a reliable tool for dental health . . . it provides nutrients essential for development of sound tooth structures and, under certain conditions, may be a dietary aid in caries control. These are facts of obvious importance to all those who plan meals, whether for children, normal adults, the aging, or the sick.

*Anderson, E. P., Smith, J. K., Elvehjem, C. A. and Phillips, P. H., *Dental caries in the cotton rat.* IX. *Effect of milk rations.* Proc. Soc. Exp. Biol. and Med. 66:67, 1947; and *Dental caries in the cotton rat.* X. *The effect of fluidity of the ration.* J. Nutrition 35:371 (March) 1948.

National DAIRY COUNCIL

111 North Canal Street, Chicago 6, Illinois

Since 1915 . . . the National Dairy Council, a non-profit organization, has been devoted to nutrition research and education to extend the use of dairy products.


Aim it at any oral wound...
from a large post-extraction socket
to a small torn gum margin
Squeeze it
to get the amount of
bacteriostatic powder you need

With the Powdalator Insufflator, you spray just the desired amount of penicillin and sulfanilamide powder directly into the wound where it does the most good in preventing or controlling infection. This spot-treatment is effective, less apt to cause side-effects than high systemic doses.

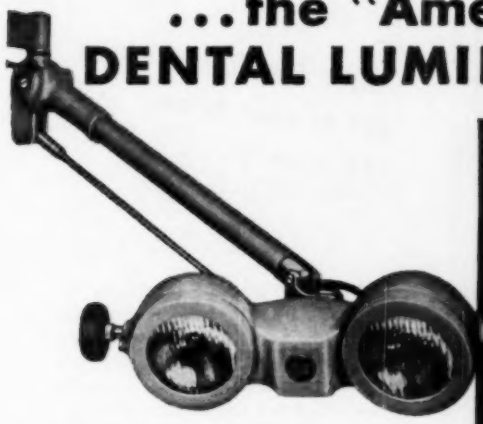
Powdalator package includes insufflator bulb and 20 sterile sealed glass tubes, each containing 5,000 units of crystalline penicillin G potassium and 0.25 Gm. sulfanilamide. Get a package from your usual supplier soon. ABBOTT LABORATORIES, North Chicago, Illinois.

Powdalator® Insufflator

(Abbott's Penicillin Sulfonamide Powder with Sulfanilamide in Insufflator Tubes)

A MILESTONE in intra-oral illumination

...the "American" DENTAL LUMINAIRE (Model DOR-12)



A Radical Departure in OPTICAL SYSTEM DESIGN which provides . . .

Maximum Illumination of 1000 Foot Candles, an equivalent of 1/3 the maximum light intensity of the matchless American Major Surgical Luminaire. The two 30 watt lamps give utmost economy.

Color Correction to daylight, approximately 4000° Kelvin color quality of illumination.

Heat Control accomplished by filtering of heat at source. Limits heat rise at focal pattern to only 1/2° F. above room temperature.

No Glare to Patient, as especially designed control lenses provide a uniform and sharply defined rectangular pattern 14" wide but only 4" high.

Shadow Reduction, an advantage of super-imposed light beams, assures adequate oral cavity penetration when fingers or instruments are projected into the field.

ADDITIONAL HIGHLIGHTS

include the use of 2 automotive type, sealed-beam spotlight lamps, *an exclusive feature* which completely eliminates the possibility of dust or film collecting on the reflector surfaces.

Dual light source permits continuation of work in the event of failure of one lamp.

Features unlimited flexibility not only in the horizontal plane but also in the vertical plane when patient is in Trendelenberg angle, and provides fingertip control from any chair position.

FITS ANY MODERN DENTAL UNIT or may be separately mounted on wall bracket.

Order through your dealer or write for further details

AMERICAN STERILIZER COMPANY
Erie, Pennsylvania

DESIGNERS AND MANUFACTURERS OF SURGICAL STERILIZERS, TABLES AND LIGHTS

We're glad to cooperate by reminding you to buy A.D.A. Relief Fund Christmas Seals

ever ready, ever fresh at your fingertips!

Finest quality, soft, absorbent, Johnson & Johnson gauze. Neat, ravel-free edges. Sterilized after packing and folded so that only one napkin at a time is withdrawn. Supplied 6 x 6 with Dispensing Fold, boxes of 100 or 500. Also flat, boxes of 500.

Johnson & Johnson

DENTAL DIVISION

NUFOLD

DENTAL NAPKINS

perfect for fluoride application!

Machine-wound, with uniform absorbent qualities, these inexpensive applicators save you time and money! Use them for preinjection drying, medication, etc. Tips securely anchored, supplied in two stick lengths; 3" or 6" long, 2000 of a size to a box.

Johnson & Johnson

DENTAL DIVISION

COTTON-TIPPED APPLICATORS

Takes the GUESS-WORK out of your income tax reports . . .

The best intended, most scrupulously filled-out tax reports carry little weight if facts and figures are not available to back them up. You will *have* these facts and figures, properly organized, when you use the Daily Log—the business record book designed for the dental profession and for tax reporting.

The DAILY LOG

Record Book for Dentists

A favorite for over 16 years —used by more dentists than any other. Instructions included —no special bookkeeping training needed. Complete in one handy volume—over 475 pages.

Available through your dental supply dealer, or send this coupon for quick action.

Only $6.50

Complete information free on request

COLWELL PUBLISHING CO.
262 University Ave.
Champaign, Illinois

Send me sample pages and complete information on the 1950 DAILY LOG for Dentists.

Name .....

Address .....

Some things just don't change . . .

In your own experience, you have seen new equipment, new methods, and new drugs replace the old in a constant stream of improvement. *Some* products, however, are so basically "right" that neither their form nor value varies from generation to generation.

Such a product is pure Sodium Bicarbonate U. S. P.

Universally used and acceptable for use as a dentifrice, mouth wash, and cleansing agent.

1. Reduces L-acidophilus count

2. Brightens teeth to natural color

3. Assures mouth "freshness"

4. Keeps your instruments bright!

A few spoonfuls in sterilizing water insure instruments against tarnish even though kept in the solution for hours.

Available everywhere at extremely low cost.

Arm & Hammer or Cow Brand Baking Soda

Accepted
COUNCIL on DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION

CHURCH & DWIGHT CO., Inc.

10 Cedar Street • New York 5, N.Y.

the essential 2nd STEP... in filling your prescription

STEP ONE . . .
Careful survey determines the undercut areas and most favorable path of insertion.

STEP TWO . . .
Expert design then provides the basic plan for a restoration that slips easily to place yet resists unseating by sticky foods.

DESIGN is the essential second step in filling your prescription at BOOS—in making all BOOS-processed cases match your own personal performance. Executive experts with years of training and experience decide on the type and placement of clasps, and plan to have all clasps work together to provide stability and retention without stress during mastication.

The designer's work thus enables BOOS skilled technicians, working with the finest materials and most modern laboratory technics, to create restorations which require minimum chair time for you and provide long, satisfactory service to your patients.

ADA RELIEF FUND

Since 1902 increasing numbers of dentists throughout the country have utilized BOOS for all their prosthetic work. A trial case will best demonstrate how this practice-building service will benefit you. Whether ordinary or involved, plan to send your next case to BOOS.

HENRY P. BOOS DENTAL LABORATORIES, Inc.

808 NICOLLET AVENUE • MINNEAPOLIS 2, MINNESOTA

BRANCH LABORATORIES | Equitable Bldg. • Des Moines, Iowa
Medical Arts Bldg. • Duluth, Minnesota

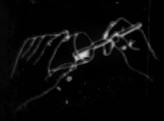
EST. 1902

Recommend the INGRAM THREE-STEP ROUTINE:

1

Tilt a clean glass tumbler and pour ½ teaspoonful of powder on the inside curved surface.

2



Moisten toothbrush, dip it into powder and brush all surfaces of the teeth and gum margins.

3

Pour water on remaining powder in glass until one third full. Mix, use as rinse, retaining in mouth for full minute. Do not follow with clear water or other rinse.

The only way a patient can learn about

INGRAM *ammonium ion* TOOTH POWDER

is through **your** prescription or **your** recommendation. **INGRAM** is advertised to the dental profession only.

For the most effective aid in combatting dental caries INGRAM AMMONIUM ION TOOTH POWDER should be used upon arising and before retiring and immediately after each meal.

Literature and supplies to help you introduce INGRAM home dental care to your patients have been mailed. Additional copies may be obtained on request.

The Council on Dental Therapeutics of The American Dental Association has accepted INGRAM AMMONIUM ION TOOTH POWDER for clinical trial.

***Product of* BRISTOL-MYERS**
19 West 50 Street, New York 20, N. Y.

Columbia Rubber MODEL FORMERS

Make Neat Bases on Your Study Models

POUR plaster or stone into Model Former, mount anatomical cast and let set. The soft flexible rubber permits easy removal of model, which comes out with a perfectly smooth, symmetrical and finished base.

Upper and lower models can be made in these formers to occlude automatically!

Price per set, 1 Upper and 1 lower

No. R1—Large Size $3.50
No. R2—Medium Size 3.50
No. R3—Small Size 3.00

Study models show patients their mouths as you see them. Make study models regularly. You need them as you do X-Rays.

New Models for Cases for Patient Education—

Columbia Dentoforms in ACRYLIC

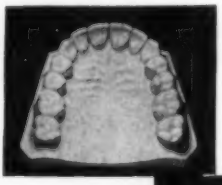
Actual Reproductions of Natural Jaws Made from Dentists' Study Models of Practical Partial Cases.

Beautifully Made in Pink and White Acrylic, the Gums and Base in Gum-Toned Pink, the Teeth in a Naturally Shaded White Acrylic.

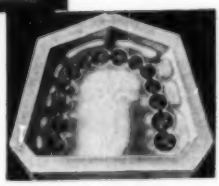
Addition of these New Acrylic Dentoforms to Columbia's line of Ivorine Dentoforms is in response to a demand for models reproducing actual mouth conditions as encountered in daily practice. Being hand-packed in molds made from actual study models, these Acrylic Dentoforms reproduce the form, condition and position of the natural teeth as well as the edentulous areas. A wide range of interesting conditions is presented such as those caused by malposed, drifted or worn teeth, sharp ridges, flat ridges, etc.

Of course, we also can supply Acrylic Dentoforms of "Idealized Cases" where the originals are fine hand carved models of the teeth and jaws.

WRITE for Illustrated Chart of Acrylic Dentoforms, Prices, etc.



MAKE Demonstration MODELS from SURPLUS PLASTER



with COLUMBIA RUBBER DENTOFORM MOLDS

Better than sketches to explain cases to patients

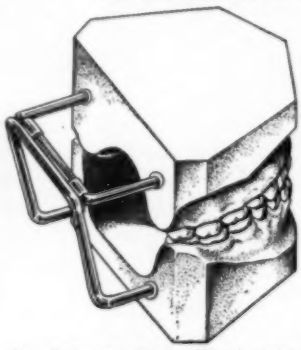
Instead of wasting surplus plaster pour it into the Mold. If not enough, add the next excess mix, first wetting the set plaster.

To make Models with Ivorine abutments, insert Ivorine Teeth into Mold before pouring.

Sets of Upper and Lower Molds Now Available

No. R20—A set without 3rd molars..... $5.00
No. R22—A set with 3rd molars..... 5.00
No. R24—A set for deciduous models..... 5.00
Ivorine Teeth, each..... .50

ARTICULATE Your Study Models



The Columbia Study Model Articulator is of sturdy construction, being made of ⅛ inch diameter nickel-silver rod.

To mount models, drill the four holes (template and drill supplied) and attach prongs with sticky wax. To remove articulator from cast, merely heat prongs and withdraw. Casts remain unmarred.

These articulators can be used repeatedly.

PRICES

Cat. No. 805—Four Columbia Study Model Articulators with Template and Drill.... $3.00
Cat. No. 806—Additional Articulators, each.. .60

Send Your Contributions Today to the A.D.A. Relief Fund

COLUMBIA DENTOFORM CORP.

"The House of a Thousand Models"—also headquarters for Brown Precision Attachments

131 East 23rd Street New York 10, N. Y.

CO-RE-GA

A brand name insures the makers responsibility

CO-RE-GA is the denture adhesive known wherever dental sundries are distributed and dentistry is practiced.

CO-RE-GA IS NOT ADVERTISED TO THE PUBLIC

Accepted COUNCIL on DENTAL THERAPEUTICS AMERICAN DENTAL ASSOCIATION

Mail this coupon for your supply of professional samples

Dr. _____

Address _____

City _____ Zone _____ State _____

CO-RE-GA CHEMICAL COMPANY

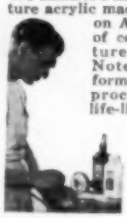
208 St. Clair Avenue, N. W. • Cleveland 13, Ohio

Please Visit Us—

We hope you plan to attend the Chicago Midwinter Dental Meeting, Feb. 6-9. Along with the interest-packed program it presents an opportunity to examine at first hand the latest in materials and processing techniques. We invite you to visit booth No. 51 and see for yourself why Hygienic quality products are favorites with discriminating dentists and dental technicians everywhere.

HYGIENIC ACRYLIC

We think it's the finest denture acrylic made. Included on A. D. A. list of certified denture materials. Noted for uniformity, ease of processing and life-like colors. A variety of shades, granulations and setting times.



DENTAL DAM

The finest Dental Dam available. Made of pure liquid latex. Strong, tough and resists aging and deterioration. In 5" and 6" rolls or pre-cut to 5" x 5" and 6" x 6" size. Dark and light natural.

DENTAL STOPPING

Dentists tell us "Hygienic surely makes fine stopping." It is tough, resists attrition, yet works beautifully and stays put. White, pink, tooth or assorted in 4-oz. bottle or 1½-oz. box.

Other *Hygienic* Products

Surgical Tubing	Dental Rubber	Foot Comfort Cushions
Covered Tubing	Cold Cure Acrylic	CC Trimmers
Latex Bulbs	Dental Wax	Dr. Dietrich's Material

THE HYGIENIC DENTAL RUBBER COMPANY, Akron 8, Ohio, U.S.A.

VISIT THE HYGIENIC EXHIBIT IN BOOTH No. 51

THE MEDICAL PROTECTIVE COMPANY

FORT WAYNE, INDIANA

Professional Protection Exclusively since 1899

A NEW LOOK...

. . . at an old subject

. . . toothbrushing, dentifrices, toothbrushes and mouthwashes. A leaflet of condensed information. Sample copies and quotations for quantity order will be sent on request.

AMERICAN DENTAL ASSOCIATION
222 EAST SUPERIOR STREET • CHICAGO 11

DENTAL HEALTH RECORDINGS

By Bob Hope, Bing Crosby,
Cornel Wilde, Robert Taylor,
Amos 'n Andy and Tony Martin

A NEW PRICE

The dental health messages by these radio and motion picture artists are exceptionally entertaining as well as educational. Each recording contains information on the importance and maintenance of dental health.

The records are appropriate for use in schools and by P.T.A.'s and other community groups. The album also contains graded teaching booklets for use in schools.

Six recordings on three unbreakable 12 inch records, complete with album and booklets . . . $10.00 postpaid.

Place your order now for future delivery.

Not for rental or broadcasting

Prepared under the direction of
Southern California State Dental Association

Send for 1949 catalog of A.D.A. dental health education material.

AMERICAN DENTAL ASSOCIATION

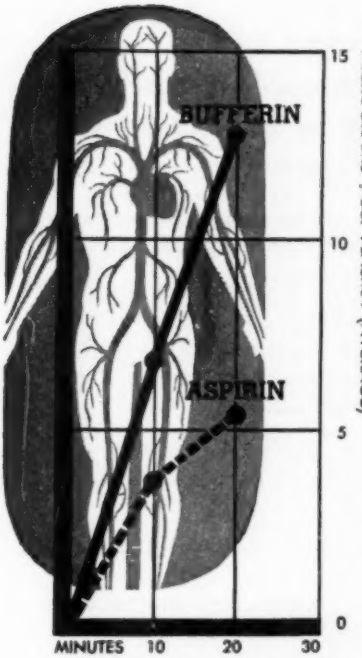
222 East Superior Street

Chicago 11, Illinois

higher blood salicylate levels more quickly with

BUFFERIN

ASSURES PROMPTER ANALGESIC ACTION



COMPARISON OF BLOOD SALICYLATE LEVELS AFTER INGESTION OF ASPIRIN AND BUFFERIN

Accepted
COUNCIL on DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION

It is BUFFERIN's speedier absorption into the blood stream which promotes its more rapid analgesic action. Within 10 minutes after its ingestion the blood salicylate levels are as great as those attained by aspirin in twice this time. In 20 minutes BUFFERIN's blood salicylate levels are double its 10 minute levels.

BUFFERIN is better tolerated—an added advantage. Gastric distress—sometimes found when aspirin is taken—is almost unknown when BUFFERIN is the analgesic used; for, in addition to its 5 grains of acetylsalicylic acid, it provides optimal proportions of the antacids magnesium carbonate and aluminum glycinate.

Patients appreciate the **"faster pain relief with better gastric tolerance"** which BUFFERIN provides.

INDICATIONS in Dental Practice:—May be prescribed routinely for the symptomatic relief of pain following dental surgery, extractions, etc. Used preoperatively it reduces the pain of cavity preparation and instrumentation of tender tissues.

BUFFERIN is available in vials of 12 and 36 tablets and in bottles of 100.

BUFFERIN IS A TRADE-MARK OF THE BRISTOL-MYERS COMPANY

A PRODUCT OF BRISTOL-MYERS • 19 WEST 50 ST., NEW YORK 20, N. Y.

U. S. ARMY
MEDICAL DEPARTMENT
U. S. AIR FORCE
MEDICAL SERVICE

Take another look
At Commissioned Service
in the ARMY or the AIR FORCE
DENTAL CORPS!

Planned career advancement is yours in the Army or the Air Force Dental Corps . .

A separate Dental Corps promotion list with promotion based on selection assures advancement for qualified, efficient officers. Reserve officers share equally with Regular officers in promotions.

Steady progress, professionally and personally, plus increased professional standing, are *assured.*

Dental officers receive extra professional pay in addition to base pay and allowances. Retirement benefits for "Reserves" as well as "Regulars" add to substantial financial security, now and later.

Your skills are vitally important to the national security effort. Write the Surgeon General, U. S. Army, or the Surgeon General, U. S. Air Force, Washington 25, D. C., for full details about Reserve Commissions and active duty.

For EXTRACTION ANESTHESIAS

with Prompt, Quiet, Smooth Recovery

RAPID induction of anesthesia, prompt uneventful recovery, and infrequent nausea or vomiting make Vinethene a very satisfactory inhalation anesthetic agent for extractions that may be accomplished within a short period of time. Patients usually may be dismissed after an observation period of but ten to fifteen minutes following recovery.

Vinethene also is widely employed as a complement to nitrous oxide-oxygen. The addition of a small quantity of Vinethene vapor to the gases permits and makes necessary the use of a relatively high oxygen concentration.*

Literature mailed on request.

**An adequate oxygen or air supply and an unobstructed airway are of greatest importance in Vinethene anesthesia. A comprehensive description of the* Actions and Uses *of Vinethene may be found in* Accepted Dental Remedies.

VINETHENE®

VINYL ETHER FOR ANESTHESIA U.S.P. MERCK

An Inhalation Anesthetic for Short Operative Procedures

COUNCIL ACCEPTED

MERCK

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

New York, N. Y. • Philadelphia, Pa. • St. Louis, Mo. • Chicago, Ill. • Elkton, Va. • Los Angeles, Calif.

In Canada: MERCK & CO., Ltd. Montreal • Toronto • Valleyfield

The NEW Crescent WIG-L-BUG (Patented)

Here is the NEW, streamlined Model of the famous Wig-l-bug, the wonder electric-mortar-and-pestle that is placing amalgam work on a scientific basis. The dependable, trouble-free Wig-l-bug mechanism—that has proved so successful—is now housed in beautiful bakelite. And a New, accurate, easy-to-read electric timer has been added.

Requires only 7 to 10 seconds to triturate enough amalgam for the average filling. Saves time, prevents waste, produces uniformly perfect mixes with a smooth, fine texture. Use the Wig-l-bug with your preferred alloy.

Thru Your Dealer or Direct

Crescent DENTAL MANUFACTURING CO.
1839 South Pulaski Road, Chicago 23, Illinois

AMMONIACAL SILVER NITRATE SOLUTION (HOWE)

REDUCE the danger of infection in cavities by

REDUCING

Ammoniacal Silver Nitrate solution with Eugenol or Formaldehyde.

SUPPLIED IN THE DROPPER BOTTLES

"THE DROP HITS THE SPOT"

AMMONIACAL SILVER NITRATE	$2.00
EUGENOL	.50
FORMALDEHYDE	.50

SINGLE BOTTLES OR COMBINATION

PRODUCTS OF

KING'S SPECIALTY CO.
FORT WAYNE, IND.

SODIUM FLUORIDE SOLUTION 2%

IN THE PLASTIC BOTTLE FOR A MORE STABLE SOLUTION

IN 8 OZ. SIZE ONLY	$1.50
FOUR 8 OZ. SIZE	5.50

THE "TWO GOOD MIXERS" are available when you need

ZINC OXIDE
(Analytical Reagent)
4 OZ. $1.00

EUGENOL, U.S.P.
1 OZ. $1.00

PRODUCTS OF

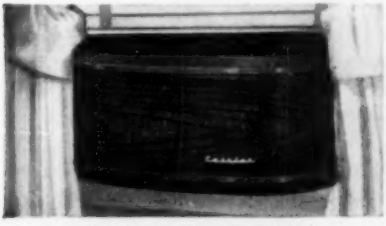
KING'S SPECIALTY CO.
FORT WAYNE, IND.

"They won't go home, Doctor—it's so nice and cool here!"

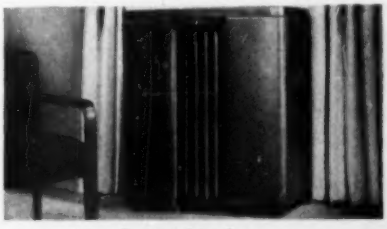
THAT's not so farfetched—patients do notice and appreciate the benefits of air conditioning. And you'll find yourself enjoying it, too, once you put it in your office and waiting room.

A Carrier Room Air Conditioner is an asset many ways. It ends perspiration that keeps you wringing wet on sweltering days. Provides the refreshing coolness that makes the reception room more comfortable. Filters out pollen and dust to keep office furnishings fresh and clean. Cuts down distracting street noises and eliminates drafts. Means fewer broken appointments in torrid weather. Rapidly removes smoke and medicinal odors. And furnishes more cooling per $ than any unit of comparable size.

Designed and built by men who know air conditioning best, a Carrier Room Air Conditioner is quiet, handsome and easy to install. Your Carrier dealer knows his business. He's listed in the Classified Telephone Directory—call him today for information. Carrier Corporation, Syracuse, New York.



New Carrier Window Model



Console Model for larger rooms

CARRIER ROOM AIR CONDITIONERS • AS LITTLE AS $34.95 DOWN

BALANCE IN EASY MONTHLY PAYMENTS

Carrier

AIR CONDITIONING
REFRIGERATION

the basis for a fine impression

KonOral is formulated to give you all the working qualities essential to fine impressions.

KonOral
- contains no Zinc Oxide or Eugenol
- can be used with any technique, in any type of tray
- has natural affinity for tissue
- starts setting after tray is seated
- flows beyond limits of tray
- can be added to and returned to mouth

☐ Send one Introductory Package of KonOral (6 to 9 impressions) ..... @ $2.00

☐ Send one Standard Package of KonOral (12 to 18 impressions) ..... @ $3.25

through

Dealer .....

City .....

Dr. .....

Street .....

City .....

State .....

KONORAL DIVISION, PERMATEX COMPANY, INC., BROOKLYN 29, N. Y.

THE Journal OF THE
AMERICAN DENTAL ASSOCIATION

JANUARY 1950 • VOLUME 40 • NUMBER 1

MORPHOLOGIC CHARACTERISTICS OF THE SMALLER ORAL TREPONEMES AND BORRELIA VINCENTI AS REVEALED BY STAINED SMEAR, DARKFIELD AND ELECTRON MICROSCOPIC TECHNICS

Edward G. Hampp, D.D.S., M.S., Bethesda, Md.

KNOWLEDGE of oral spirochetal morphology has been acquired by systematic investigation of material obtained from infected hosts and in certain instances from pure cultures of organisms maintained on artificial culture media. Many staining methods have been advocated for spirochetes contained in infected tissue as well as for smears of these organisms and such methods have been used to advantage within certain limits. Darkfield illumination of wet preparations of spirochetes has materially aided in the investigation of the finer structural characteristics of these organisms since they may be observed in the living state without undue change in physical character as the result of fixing and staining procedures. However, there still exist many controversial questions concerning the finer structural elements of the spirochetal cell. In this laboratory the electron microscope has been employed to further investigate the morphologic and structural characteristics of certain cultured strains of spirochetes representative of the genera Treponema and Borrelia.[1]

It is the purpose of this paper to describe and compare the morphologic characteristics of pure cultures of the smaller oral treponemes and *Borrelia vincenti* as observed by direct illumination of stained smears, darkfield illumination of wet preparations and electron mi-

Read before the Section on Research, eighty-ninth annual session of the American Dental Association, Chicago, September 16, 1948.

Research Associate, National Institute of Dental Research, National Institute of Health, U.S.P.H.S., Bethesda, Md.; Fellow, Research Council, American Dental Association.

1. Hampp, E. G.; Scott, D. B., and Wyckoff, R. W. G., Morphologic Characteristics of Certain Cultured Strains of Oral Spirochetes and Treponema Pallidum as Revealed by the Electron Microscope. *J. Bact.* 56:755 (Dec.) 1948.

croscopic examination of metal shadowed specimens.

Technic and Methods

Pure cultures of 35 strains of the smaller oral treponemes and three strains of *Bor. vincenti,* isolated from human cases of oral infection, were employed in the stained smear and darkfield examinations. Young, actively proliferating cultures were used in all instances since they are generally considered to be typical of the species. Samples of organisms were obtained from the periphery of the advancing edge of growth and were suspended in sterile physiologic sodium chloride solution. Small amounts of the bacterial suspensions were used to make heat-fixed stained smears and, at the same time, wet preparations were made from the same sample. The wet specimens served as controls for examination of living organisms under the darkfield microscope.

The stain employed for the air-dried, heat-fixed films was crystal violet: 1 part of a saturated solution of the dye in 95 per cent alcohol and 9 parts of distilled water.

In the electron microscopic study six pure cultures of spirochetes were employed. Two of these were strains of the smaller oral treponemes and four were *Bor. vincenti;* all strains were representative of our collection of these types of spirochetes. All organisms were grown in a clear liquid medium which is a modification of Huntoon's "hormone" agar.[1, 2] Prior to use the medium was filtered through a Berkefeld "N" filter to remove any particulate matter. The cultures were incubated at 37 C. in 25 cc. rubber-stoppered volumetric flasks. At the expiration of the desired incubation period, the cultures were centrifuged and the sedimented organisms washed and recentrifuged five to seven times in distilled water to remove salts, soluble proteins and particulate matter. This treatment is necessary in order to obtain clean preparations for electron microscopy. After the last washing the spirochetal cells were suspended in distilled water containing 0.1 per cent formaldehyde and then placed in the refrigerator overnight.

The stock suspensions of spirochetes were diluted to arbitrary concentrations and microdrops dried on the usual collodion-covered specimen screens. Approximately 250 screens were made from 25 separate cultures. The spirochete containing screens were "shadowed" by oblique evaporation of 40 mg. of chromium from a filament placed 18 cm. behind and 3 cm. above the specimens. These were examined with an RCA type EMU microscope.

Results

Smaller Oral Treponemes.—Figure 1 is a photomicrograph of a darkfield and stained smear preparation of one of the smaller oral treponemes prepared from the same suspension of organisms. The darkfield illustration exhibits organisms with closely knit symmetrical spirals in addition to the fine tapering extremities which are characteristic of this species. They are not double contoured. Terminal filaments may be found at one or both ends of the organisms; they appear as extremely fine, single fibers and are usually coiled in the same manner as the spirochete. These structures are barely within the limits of visibility and are extremely difficult to photograph; consequently the terminal appendages are not shown in the photomicrograph. Neither cell membranes nor flagella have been demonstrated.

Figure 1, right, is an air-dried, heat-fixed stained smear of the smaller oral treponemes exhibiting organisms with a moderate to a great degree of distortion, which primarily affects the shape, size

2. Huntoon, F. M., Hormone Medium. *J. Infec. Dis.* 23:169 (Aug.) 1918.

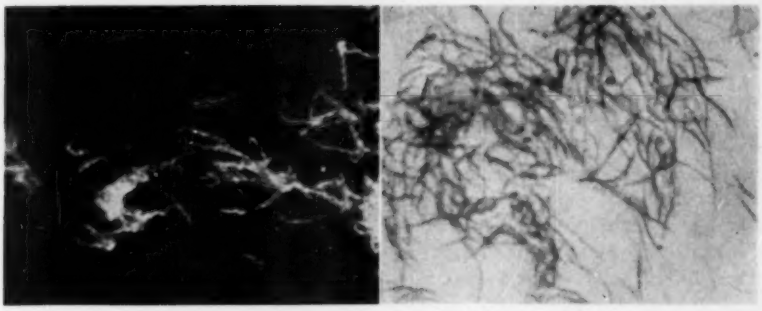


Fig. 1.—Photomicrographs of one of the smaller oral treponemes prepared from the same suspension of organisms (× 1400). Left, darkfield illustration showing closely knit symmetrical spirals and fine tapering extremities which are characteristic of this species. Right, air-dried, heat-fixed stained smear. The tendency of the organisms to unfold their spirals and assume a straight form is adequately portrayed

and spacing of the spirals. The tendency of the organisms to unfold their spirals and assume a straight form is adequately portrayed. These altered organisms vary from long wavy filaments to almost straight forms which exceed the length and, in some instances, the width of the spirochetes demonstrated in the control darkfield photomicrograph. Many of the types shown could easily be confused with the intermediate forms of *Bor. vincenti*. The normal fine tapered extremities are blunted by this treatment. Neither cell membranes, terminal filaments, nor flagella have been observed. The probable explanation for such alteration of cellular morphology may be based on several facts: the extreme length of the oral treponemes in comparison with their width tends to cause the organisms to unfold their closely knit, symmetrically spaced spirals when dried in air, and this tendency is further accentuated during the process of fixation by heat. In addition, the small treponemes have been found more stain resistant than the other oral spirochetes, which often necessitates prolonged staining and, in certain instances, steaming of the dye to obtain a suitable preparation.

Electron micrographs of the smaller oral treponemes are shown in Figure 2. Figure 2, left, exhibits the shallow closely knit, symmetrically spaced spirals that are characteristic of this species. The ends are delicately pointed. Definite cell membranes have not been observed in any of the specimens examined and if they exist they must be tightly adherent to the organisms.

Terminal filaments are frequently observed by electron microscopy and are usually coiled in the same manner as those observed by darkfield examination. Some of these appendages are short, others are extremely long as compared with the length of the individual organisms. Darkfield studies of these structures suggest that the filaments are single fibers; however, under the higher magnification of the electron microscope it is evident they consist of intertwined fine strands (Fig. 2, right). It has been postulated[3] that the terminal filaments are continuations of the periplast, but no evidence has been found to support this assumption. Noguchi[4] indicates that the terminal fila-

3. Smith, D. T., *Oral Spirochetes and Related Organisms in Fuso-Spirochetal Disease*. Baltimore: The Williams and Wilkins Company, 1932.

4. Noguchi, H., *The Spirochetes. The Newer Knowledge of Bacteriology and Immunology*. Chicago: The University of Chicago Press, 1928.

ments represent portions of an axial filament; however, no evidence of this was observed.

In addition to the terminal filaments other flagellar processes have been observed in all strains of the smaller treponemes (Fig. 2). Flagella occur anywhere along the spirochetes. They are found singly and in tufts and are sometimes intertwined to form cords. Figure 2, left, exhibits a cord-like structure wrapped around the full length of the organism and may represent a single long flagellum. The presence of flagella on spirochetes other than the smaller oral treponemes and *Bor. vincenti* has been described by other investigators[5, 6, 7, 8] using the electron microscope. Mudd, Polevitzky and Anderson[8] were not able to demonstrate flagella on *Treponema microdentium*. (The term small oral treponemes has been employed in preference to *Treponema microdentium* because of the confusion which exists concerning the number of species of oral Treponemata.) Evidently the previously held opinion[4, 9, 10] that spirochetes are devoid of flagella is incorrect.

Borrelia vincenti.—Figure 3 represents darkfield and stained smear photomicrographs of a pure culture of *Bor. vincenti* both of which were prepared from the same spirochetal suspension. In Figure 3, left, it is apparent that these spirochetes are longer and wider, and the spirals are proportionally larger and more widely spaced as compared with the smaller oral

5. Wile, U. J.; Picard, R. G., and Kearney, E. B., The Morphology of Spirocheta Pallida in the Electron Microscope. *J.A.M.A.* 119:880 (July) 1942.

6. Morton, H. E., and Anderson, T. F., Some Morphologic Features of the Nichols Strain of Treponema Pallidum as Revealed by the Electron Microscope. *Am. J. Syph., Gonor. & Ven. Dis.* 26:565 (Sept.) 1942.

7. Wile U. J., and Kearney, E. B., The Morphology of Treponema Pallidum in the Electron Microscope: Demonstration of Flagella. *J.A.M.A.* 122:167 (May) 1943.

8. Mudd, S.; Polevitzky, K., and Anderson, T. F., Bacterial Morphology as Shown by the Electron Microscope. *J. Bact.* 46:15 (July) 1943.

9. Bergey, D. H., and others, *Bergey's Manual of Determinative Bacteriology*, ed. 5. Baltimore: Williams and Wilkins Company, 1939.

10. Topley, W. W. C., and Wilson, G. S., *The Principles of Bacteriology and Immunity*. Baltimore: William Wood & Company, 1936.

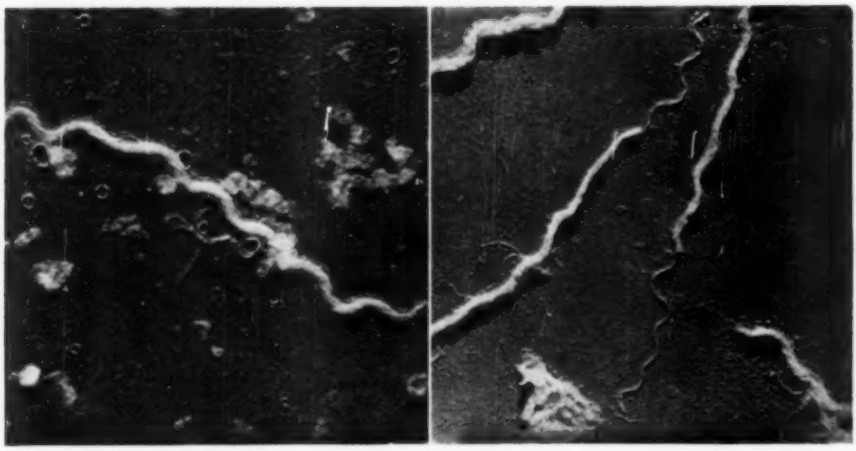


Fig. 2.—Electron micrographs of the smaller oral treponemes (× 7500). Left, exhibits the shallow closely knit, symmetrically spaced spirals that are characteristic of this species. Right, shows terminal filaments consisting of intertwined fine strands

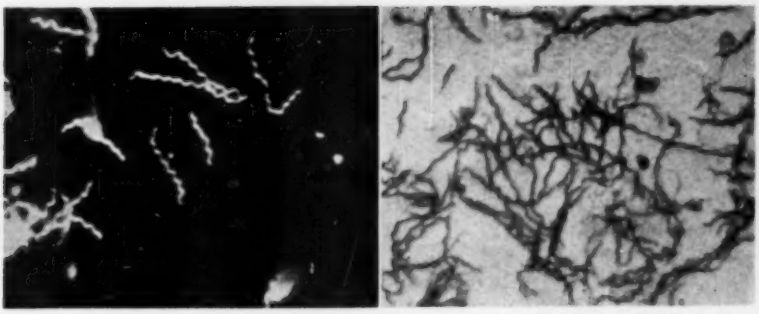


Fig. 3.—Photomicrographs of a pure culture of Borrelia vincenti (× 1400). The darkfield photomicrograph exhibits cells that are singly contoured and the ends are abruptly tapered. The air-dried, heat-fixed stained smear exhibits spirochetes varying from almost straight forms to thin, wavy, ribbon-like filaments

treponemes. In addition, the spirals are regularly and symmetrically spaced. It is customary to find descriptions in the literature[3, 11, 12, 13] describing *Bor. vincenti* as possessing irregular spirals. Our observations do not support these descriptions. In this study, irregularly spaced spirals have been encountered only in air-dried, heat-fixed, stained smears to be described later. The darkfield photomicrograph exhibits cells that are singly contoured and the ends are abruptly tapered. Terminal filaments are observed on a large percentage of the cells, but do not permit photographic reproduction. They may be found at one or both ends and appear as single fibers and are usually spiral in structure. Occasionally straight filaments are encountered. Up to the present time flagella have not been observed by this method.

The phenomenon of altered structure of the smaller oral treponemes in stained smears is not restricted to this group of spirochetes, but is equally evident in the larger oral borrelia. Figure 3, right, is an air-dried, heat-fixed stained smear of *Bor. vincenti*. Here, as in the case of the small treponemes, it is apparent that the greatest amount of physical distortion is found in relation to the shape, size and spacing of the coils. The photograph exhibits spirochetes varying from almost straight forms to thin wavy, ribbonlike filaments possessing widely spaced irregular, shallow spirals, and are very unnatural when compared with the organisms displayed in the control darkfield photograph. Their extreme length and widely spaced spirals which are characteristic of this species increase their tendency to assume a straight line when dried in air and fixed with heat. The ends are usually blunted by such treatment. Neither terminal filaments nor flagella have been observed in such preparations.

Electron micrographs of a pure culture of *Bor. vincenti* are shown in Figure 4. In all instances short forms of these organisms were selected in order that the entire organisms might be included in a photographic plate. The spirals are larger and wider than those of the small treponemes previously demonstrated by the

11. Proske, H. O., and Sayers, R. R., Pulmonary Infection and Pneumoconiosis; Bacteriologic and Experimental Study. *Pub. Health Rep.* 49:839 (July) 1934.

12. Klein, H. S., Oral Spirochetes, Their Occurrence in Diseases of the Oral Cavity and a Simple Method of Pure Cultivation. *Acta. Odontol. Scandinav.* 5:1 (Oct.) 1943.

13. Thomson, J. G., and Thomson, D., Some Researches on Spirochetes Occurring in Alimentary Tract of Man and Some of the Lower Animals. *Proc. Roy. Soc. Med.* 7:47 (July) 1914.

same method. The spirals are not evenly spaced and the organisms appear straighter than corresponding organisms viewed by darkfield illumination, which is probably the result of the rigorous treatment used in preparing the specimens for electron microscopy. The air drying of organisms on collodion screens may also contribute to the altered morphology. The external surfaces of both the smaller oral treponemes and *Bor. vincenti* are strikingly similar by electron microscopy. Most surfaces are not smooth and their irregularities, as indicated by their shadows, may be the result of uneven distribution of the protoplasm. This is best portrayed by Figure 4, right. Here again, definite cell membranes have not been observed. The ends of the organisms are abruptly tapered. Terminal filaments are a frequent finding and are not single fibers but consist of multiple strands (Fig. 4, right). Flagella have been observed on all strains of *Bor. vincenti,* occurring singly and in tufts (Fig. 4) and are sometimes intertwined to form cords.

Spirochetal Granules.—Any discussion of the characteristics of pure cultures of the oral spirochetes would not be complete without consideration of the spirochetal granules that are so characteristic of these organisms. It was the intriguing nature of these structures that prompted the electron microscopic observation of the oral spirochetes. In this discussion, stained smear preparations of spirochetal granules will not be considered in detail as these structures are more clearly depicted by darkfield illumination and electron microscopy. The granules may be considered to be of three types: namely, internal granules, end granules and external granules.

Internal granules have been frequently observed within the cytoplasm of spirochetes both by stained smear and darkfield illumination. They have often been encountered in the cultures of organisms employed in this investigation and may be single or multiple. When several of these structures are found within a single spirochete they impart to the organism a beaded appearance. Figures 5, 6 and 7

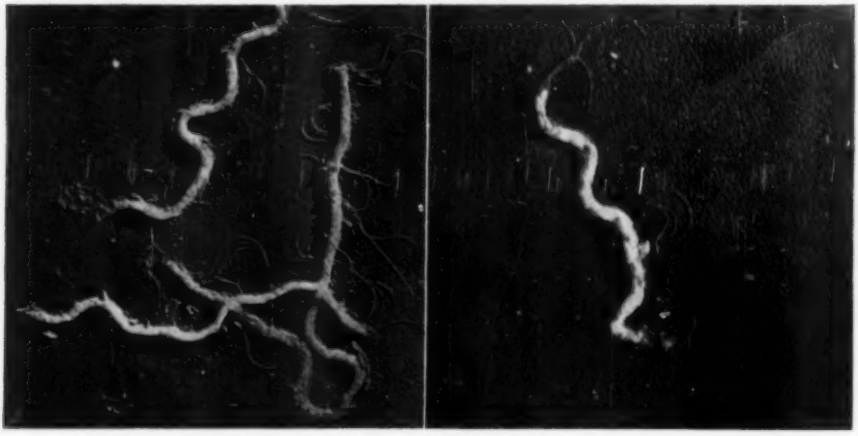


Fig. 4.—Electron micrographs of a pure culture of Bor. vincenti. Left, shows flagella occurring singly and in tufts (× 7500). Right, shows uneven distribution of protoplasm and also terminal filaments (× 10,000)

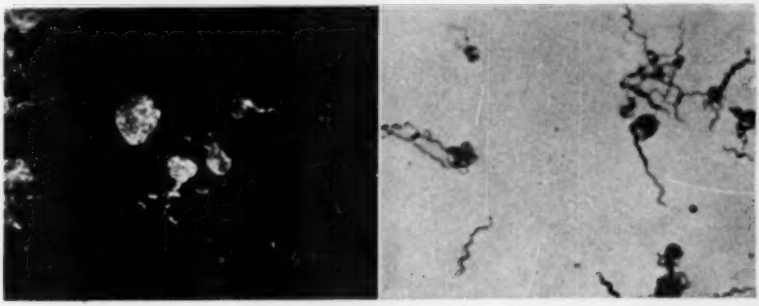


Fig. 5.—Internal and external spirochetal granules revealed by darkfield and stained smear photomicrographs (× 1400)

illustrate internal granules as revealed by stained smear, darkfield illumination and electron microscopy. Figure 5, right, exhibits a spirochete, upper left corner, containing a single internal granule in addition to an external granule to be described later. The former structure stains in a homogeneous manner and is apparently wider than the somatic portion of the organism. The typical appearance of single internal granules under the darkfield microscope are shown in the second and third illustration in the upper row of Figure 6 along with external granules that will be discussed later. They are bright white, highly refractile bodies devoid of internal structure and produce slight bulging of the cells. Several internal granules are shown within a single spirochete in the electron micrograph (Fig. 7). They apparently represent local accumulations and condensation of cytoplasm and produce irregularities in the surface of the organism as indicated by the shadows cast.

Another type of spirochetal granule is occasionally observed which is small, occurs at the end of an organism and lacks internal structural detail. Mudd, Pole-

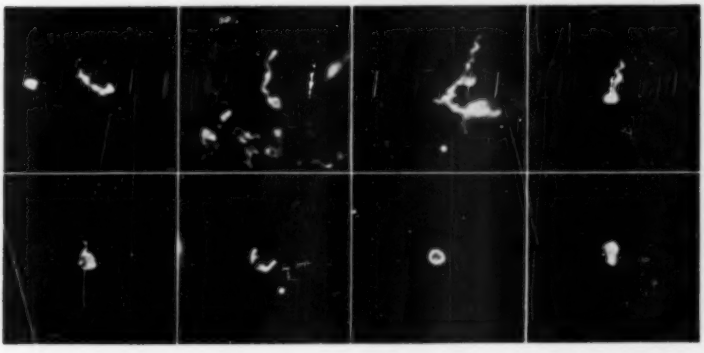


Fig. 6.—Composite darkfield photomicrographs of spirochetal granules (× 1400)

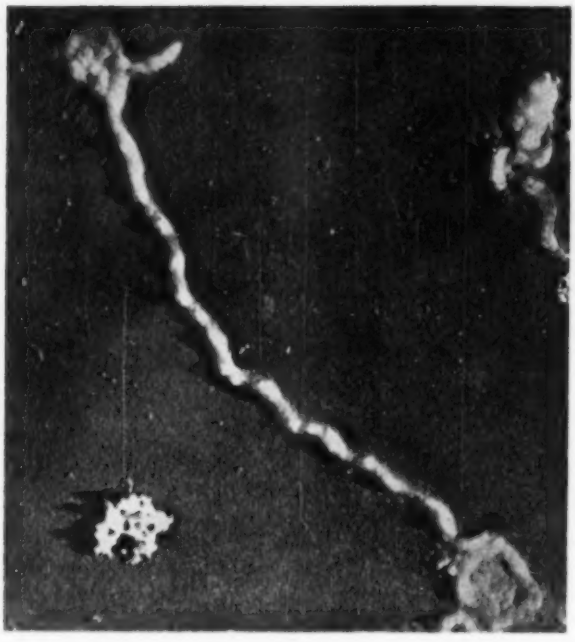


Fig. 7.—Several internal granules are shown within a single spirochete in the electron micrograph (× 11,000)

vitzky and Anderson[8] have referred to this structure as an "end granule." Figure 8A (left side) exhibits an end granule as revealed by darkfield microscopy. The appearance of this structure under the electron microscope is demonstrated by Figure 8B.

Periodic examination of spirochetal cultures indicates that about two to three weeks following inoculation another type of granule becomes evident.[14] They are intimately associated with the organisms in the early stage of formation and may occupy a middle, subterminal or terminal position. Later they are "shed" and found free in the culture media and are referred to as external granules.

The external granules do not react as do spores to the usual bacterial stains. On the contrary, the granules react to stain in a manner similar to the nucleus of a fixed tissue cell and consist of a membrane containing a fine interlacing interior network, upper left corner of Figure 5, right. The spirochetal appendage attached to the spherule stains in approximately the same manner as normal organisms. When granules are overstained they take on a deep, homogeneous color and the finer internal structure is obliterated. After the granules are shed and with progressive aging they may become smaller and seemingly more dense as indicated by varying intensities of coloration.

Darkfield photomicrographs of external granules are shown in Figures 5, left, and 6. In the early stage of formation of the granules filamentous structures are occasionally observed which may be either in a terminal position or originating from the sides of the spirochetes as shown

14. Hampp, E. G., Morphologic Alteration of the Smaller Oral Treponemes During Aging of Cultures; Effect of Age on Viability of Spirochetal Cultures. *J.A.D.A.* 33:901 (Feb.) 1946.

in the upper left illustration of Figure 6. By this method of examination the granules have a characteristic appearance and are easily differentiated from extraneous material that may be present in wet preparations. They possess a bright white, highly refractile external membrane and a fine lace-like internal structure which may exhibit one or more bright white, highly refractile bodies. They are intimately associated with the spirochetal cell in a middle, subterminal or terminal position and later found free in the medium as the result of shedding. With progressive aging the granules become smaller and at approximately seven months they are more highly refractile and condensed. This observation confirms our stained smear observations that the spherules become more dense with aging as shown by the variation in color intensity.

Typical external granules as they appear by electron microscopy are shown in Figure 9. Figure 9A shows a granule in a middle position and intimately associated with the spirochete. An opaque region is seen within the sphere surrounded by a homogeneous substance that is sharply delineated. Large numbers of flagellar appendages are in evidence and these structures when matted may account for the filaments occasionally observed by darkfield examination in the early stage of granule formation. A granule occurring in a terminal position is exhibited in Fgure 9B. The contents of this structure closely resemble the free granule and may represent a more advanced stage in granule maturation.

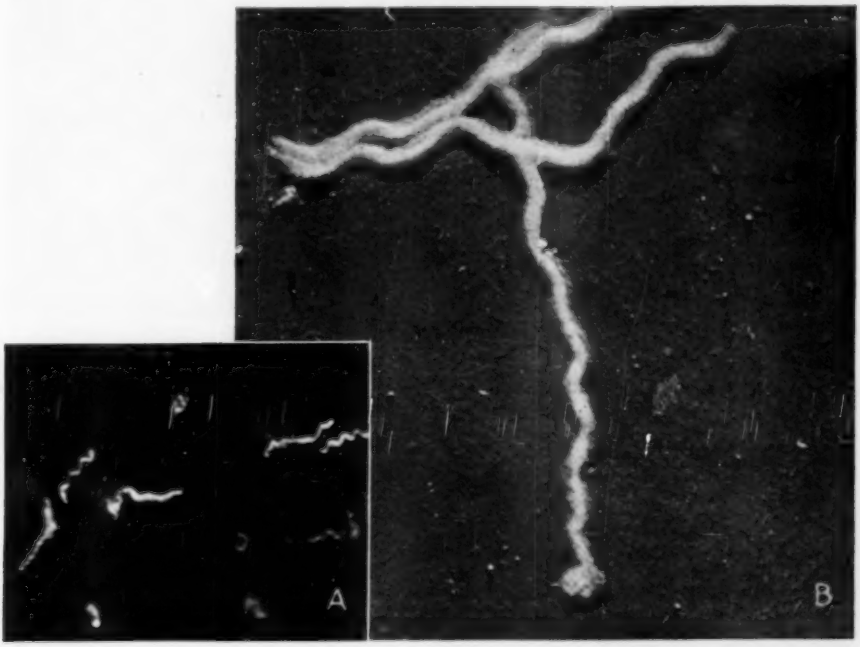


Fig. 8.—A. End granule as revealed by darkfield microscopy (× 1400). B. Similar structure under the electron microscope (× 11,000)

None of the granules examined was attached by a stalk, as indicated by Mudd, Polevitzky and Anderson[8] in their study of certain types of spirochetes. Figure 9C demonstrates a typical free granule which is the end product of granule shedding. It is more or less circular in shape, sharply bounded and contains what appears to be short sections of spirochetes closely packed together. The contents of the granule are probably responsible for the lace-like interior and the bright white, highly refractile bodies observed by darkfield microscopy.

In addition to the foregoing types of granules, there are found other larger bodies that appear to be formed by rolling up of the spirochetes. This is evidenced in some instances by the spiral nature of the external portion of the sphere and its contents. Figure 5, left, is a darkfield photomicrograph exhibiting several external granules; the large single granule without spirochetal appendages is typical of this type of structure. Its appearance under the electron microscope is shown in Figure 10 which clearly demonstrates the tangled groups of spirochetes and segments of organisms. The spirochetes contained in this type

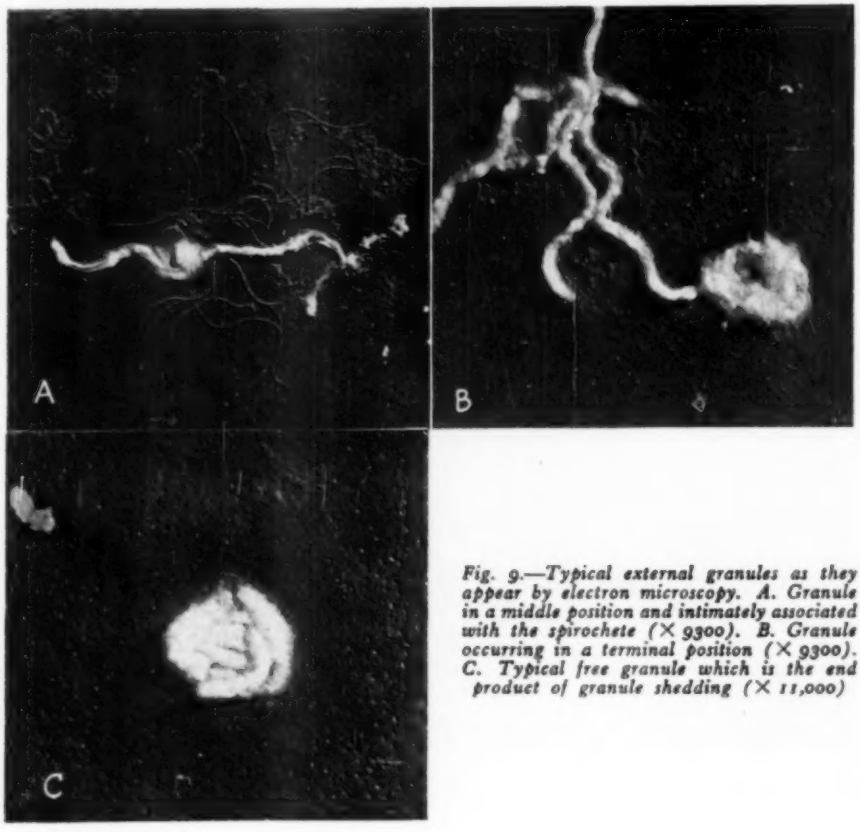


Fig. 9.—Typical external granules as they appear by electron microscopy. A. Granule in a middle position and intimately associated with the spirochete (× 9300). B. Granule occurring in a terminal position (× 9300). C. Typical free granule which is the end product of granule shedding (× 11,000)

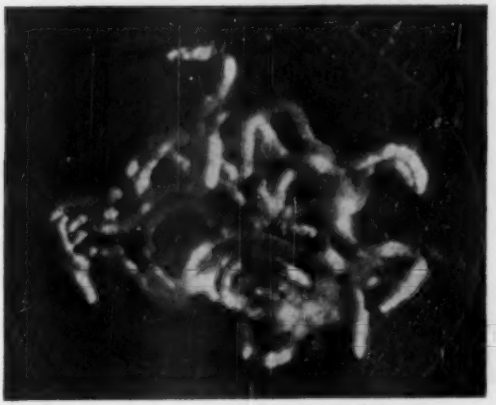


Fig. 10.—Electron micrograph of large single granule similar to the one shown in Figure 5, left. Tangled groups of spirochetes and segments of organisms are clearly shown (× 11,000)

of granule have been found to vary in number.

The significance of the spirochetal granules in the life history of these organisms is not known but certain investigators have indicated that they may represent germinative units.[8, 14, 15, 16, 17, 18] Others have been undecided or hesitant in accepting this hypothesis.[19, 20, 21, 22] It is certain that they are not artefacts or as Topley and Wilson[10] indicate, particles of culture medium adhering to the organisms. The stained smear, darkfield and electron microscopic examinations demonstrate that this explanation is wrong. Granule formation represents a definite phase in the development of the oral spirochetes. It is not possible to determine from this study whether or not the granules are germinative units; however, their constant and rhythmic production in living cultures suggests this possibility. Further support of this hypothesis is provided by the fact that cultures of certain oral spirochetes up to 31 months of age, showing only refractile granules by darkfield examination have invariably given normal growth on transfer to a fresh medium.[14]

Summary

Pure cultures of the smaller oral treponemes and *Borrelia vincenti* were studied and compared employing the stained smear observed with direct illumination, wet preparations examined with darkfield illumination and metal shadowed specimens observed with the electron microscope. The morphologic characteristics, filamentous and flagellar appendages and granules of various types have been described and illustrated.

15. Noguchi, H., Method for Pure Cultivation of Pathogenic Treponema Pallidum (Spirocheta Pallida). *J. Exper. Med.* 14:99 (Aug.) 1911.

16. Noguchi, H., Spirochetes. *Am. J. Syph.* 1:261 (April) 1917.

17. Leishman, W. D., Note on "Granule-Clumps" Found in Ornithodorus Moubata and Their Relation to Spirochetes of African Relapsing Fever (Tick Fever). *Ann. Inst. Pasteur* 32:49 (Feb.) 1918.

18. Balfour, A., Infective Granule in Certain Protozoa Infections as Illustrated by Spirochetosis of Sudanese Fowls. *Brit. Med. J.* 1:752 (April) 1911.

19. Warthin, A. S., and Olsen, R. E., Granular Transformation of Spirocheta Pallida in Aortic Focal Lesions. *Am. J. Syph.* 14:433 (Oct.) 1930.

20. Fantham, H. B., Spirochaetes and Their Granular Phase. *Brit. Med. J.* 1:409 (March) 1916.

21. Akatsu, S., Influence of Carbohydrates on Cultivation of Spirochetes. *J. Exper. Med.* 25:375 (March) 1917.

22. Wenyon, C. M., *Protozoology: A Manual for Medical Men.* New York: William Wood & Company, Vol. 2, p. 954, 1926.

BASIC FACTORS RETARDING RESORPTIVE CHANGES OF RESIDUAL RIDGES UNDER COMPLETE DENTURE PROSTHESIS

Rudolph O. Schlosser, Chicago

Among the poignant epigrams in the writings of Elbert Hubbard encountered during my student days some 45 years ago, there was one that seems distinctly appropriate to the subject matter of this article. It is: "In life there is nothing so constant as change."

When we consider the biologic changes that confront us in the planning, construction and subsequent servicing of a complete denture prosthesis, the application of the epigram becomes logical. As we contemplate the alterations which take place in the structural form of the alveolar ridges after extraction of the teeth and surgical preparation of the mouth, the further modifications which ensue as the patient remains edentulous, the subsequently more gradual changes that go on after the prosthetic dentures have been inserted, as well as inherent metabolic phenomena occurring in all living structures, we must admit that we are dealing with a constant factor, change.

I shall strive to confine my remarks to the procedures which have helped me to retard resorptive changes in the edentulous ridges under dentures, rather than to undertake a fuller discussion of all modifications previously referred to.

Many have been the panaceas offered as means to combat loss of retention and stability of dentures. Among them are the supposedly revolutionary impression methods, improved procedures for the registration of jaw relations and the recording of an acceptable denture space, and the newer tooth forms and arrangements. Variations in occluding frames and articulators as well as better denture base materials and improved methods of processing them into well fitting dentures have been developed. In spite of all this progress, controversial opinions are still rampant as to which material, instrument and method will produce the most satisfactory results.

Far be it from me to pose as a Moses and attempt to lead you out of this wilderness of confusion that still persists in our realm. The best I have to offer are a few concrete suggestions based on personal observations and experiences of more than thirty years, during which I have devoted most of my time to the study, teaching and practice of complete denture prosthesis.

The first suggestion is that we remind ourselves of the prime objective in complete denture prosthesis. An excellent method for doing this is to explain them to the patient. Let him know that, so far as it is possible in coping with the mouth conditions he presents to you, you will strive to restore masticatory function, arrange the teeth so there will be no impediment to clear speech, and restore the normal contour and profile to his face, and that you will endeavour to accomplish all this with a minimum of discomfort to him. Psychologically this procedure will have a distinctly beneficial effect on the patient.

The second suggestion is also of prime importance. It is that we give full con-

sideration to all of the biologic factors involved. This pertains not only to the gross and microscopic anatomy of the jaws and the adjacent tissue structures, but also to the influence exerted by the temporomandibular joint mechanism on the positions and movements of the mandible. In addition a comprehensive knowledge of natural tooth forms and arrangements is essential. A careful scrutiny of the edentulous ridges should also be made.

The third suggestion is that, having made a thorough mouth examination and a comprehensive diagnosis, we follow some definite plan or routine of procedure in performing the various clinical and laboratory operations necessary for the fabrication of well-fitting and well balanced dentures. Denture bases modeled after good impressions, with teeth so arranged that there is perfectly balanced occlusion in centric relation as well as in the lateral and protrusive relations, and in which the correct vertical dimension has been incorporated, will stimulate the supporting tissues and improve their tone. This will do much to retard the resorptive changes. There will be more suggestions later.

While the main purpose of this presentation is to focus attention on the basic factors that may retard resorptive changes in the ridges under complete dentures, and permit you, merely by inference, to judge what the factors are that will produce the contrastingly more rapid destructive changes of the ridges, I believe it will be in order at this time to be more specific in respect to the latter. In the order in which they are encountered they are: (1) Faulty impressions and resulting ill-fitting denture bases, (2) the acceptance of a vertical dimension of denture space which is beyond the limits of biologic tolerance, (3) failure to register correctly the centric relation of the mandible, (4) the arbitrary mounting of the casts on the articulator, (5) faulty or unbalanced occlusions, (6) a disregard of the influence of the temporomandibular joint mechanism upon the occlusions and articulation of the teeth, (7) failure to eliminate occlusal disharmonies that may be due either to faulty setting or to the processing changes that occur in the curing of the denture base resins, and (8) failure to service the dentures after their initial insertion and failure to recall the patient for periodic check-up and corrections.

The fourth suggestion is rather more inclusive than the first three, for it has to do with all of the clinical and laboratory operations necessary in the fabrication, insertion and subsequent servicing of the dentures. Stated succinctly this suggestion is that every operation be performed with meticulous care, and that each one be checked to ascertain that it is performed in such a manner that the results will obviate the faults, errors and failures enumerated in the foregoing paragraph.

Impressions

The subject of impressions has for years been a highly controversial one and from present indications will continue to be so. Ever since I was a freshman I have been told repeatedly that modeling compound is an inferior impression material, that it requires exceptional skill for its manipulation, and that the technic was too difficult to be mastered by dental students. Yet I have constructed innumerable dentures and supervised countless others that were built on casts which had been poured into compound impressions and had given years of satisfactory service.

This by no means signifies that plaster of paris, the zinc oxide pastes, the various impression waxes, or the hydrocolloid and alginate impression creams, are not good materials. For you and I know, from our own experience and from observing the work of others, that excellent results can be obtained when these materials are intelligently and skilfully employed. One

thing we should always keep in mind is that there is no foolproof material or technic for obtaining good impressions.

Once you have familiarized yourself with the mouth for which you plan to make dentures, and if you have developed the necessary skill for proper manipulation of the material you plan to use, no matter which material you employ you are bound to obtain satisfactory results. However, one more essential is consideration of the objectives to be obtained in the taking of the impressions. As I have frequently outlined them to my students they are the following: An intimate surface adaptation to the supporting tissue surfaces, maximum extension within the limits of physiological tolerance, and a nicely rounded peripheral form, which will be conducive to the comfort of the patient. Lastly, full consideration must be given to the biologic factors involved.

It is always advisable to test the completed impression for stability, retention and comfort. When an impression meets these tests satisfactorily, it constitutes a proper surface pattern for the ultimate denture base and requires only that it be carefully handled and that a suitable material be employed for the pouring of the cast upon which the baseplate and dentures are to be formed and processed. The baseplates in turn, especially if they are to be used for registrations of the vertical dimension and jaw relations, should be properly adapted to the casts to insure more perfect registrations. When severe undercuts are present, it is not always possible to remove a closely adapted shellac resin baseplate from the cast without injuring the latter. In such cases it is necessary to modify the adaptation so as to facilitate both the removal and replacement of the baseplate. The less closely adapted baseplate might easily result in producing some slight error in the centric registrations; for this, greater scrutiny of the records is advised.

To avoid much difficulty it has been my practice for years to employ the completed secondary modeling compound impression as the maxillary base in conjunction with an acrylic mandibular baseplate to which an occlusal rim has been attached. In a similar manner both upper and lower shellac resin baseplates that have been relined with an impression paste may be employed.

Registration of Vertical Dimension

Next in order comes the registration of an acceptable vertical dimension of the denture space. In recent years this operation has received considerable attention and rightfully so, for along with the registration of centric relation it is of prime importance to the successful construction of complete dentures. However, its performance has been needlessly complicated by some operators. Here again it is necessary that we clear up our conception regarding this relationship to good denture prosthesis. Perhaps the factor that will aid us most in this connection is a proper concept and recognition of the physiological rest position of the mandible. Dr. John R. Thompson[1] has shown us conclusively that this position is constant from infancy through maturity and senility, and as a result serves as an excellent reference position when determining the acceptable vertical dimension of the denture space, or as Thompson describes it, the position of occlusion.

It follows therefore that before we can register and record the acceptable denture space we must first have the patient assume the rest position of the mandible. This can be readily accomplished by having the patient bring the lips into an unstrained contact as in the making of the "M" sound, or by having the patient

1. Thompson, J. R., The Importance of the Rest Position of the Mandible to Dental Science. *J.A.D.A.* 33:151 (Feb.) 1946.

close, suck and swallow, and then relax but allow the lips to remain in contact. The rest position thus attained permits the recording of the normal length of the lower third of the face. This is done by drawing a short transverse line over the mental prominence of the chin, and measuring the distance from the anterior nasal spine to this line. To check it for accuracy the patient is requested to repeatedly open and close the lips in the manner described, and the distance is measured several times. Because this mandibular position is maintained by neuromuscular balance, the patient is subjected to no strain and can repeatedly return the jaw to this identical position.

It is a well established fact that with normal dentition there is an interocclusal clearance or freeway space between the upper and lower teeth when the mandible is in the position of physiological rest. In the incisal region the magnitude of this space is approximately 3 mm.; therefore having recorded the vertical dimension associated with the rest position, it is necessary only to record a further reduction of 3 mm., and accept this as the vertical dimension for the denture space, and subsequently to incorporate this lesser dimension in the registration and record of centric relation. The procedure in the main is extremely simple. A description follows.

The tested secondary impression with an attached occlusal rim, and the mandibular baseplate with rim, are rechecked to see that they go to place properly and show good stability. The occlusal plane is established on the upper rim and its position and inclination are scrutinized to see that they are correct. The labiobuccal surplus is trimmed away to provide proper support for the upper lip. The lingual surface of the rim is made smooth and the upper base is replaced in the mouth. The patient is then instructed to bring the mandible into the rest position. The line is drawn onto the chin and the measurements as previously described are made and recorded.

While these measurements can be made with a pair of dividers or a Boley gage, it will be found quite as easy to make them by using a sheet of baseplate wax and trimming it to the desired length. Personally I prefer the latter, finding it simpler to manipulate, and when necessary to conform to the facial contour this too can be easily done.

The next step is the actual recording of the accepted dimension for purpose of transferring it to the articulator. While many men routinely use wax rims I have always found rims made of modeling compound much more satisfactory; though for obtaining records of the positional relations I have used wax consistently for the past twenty-five years.

The occlusal plane having been established on the upper rim, the maxillary baseplate is replaced in the mouth. The occlusal surface of the lower rim is thoroughly softened, the mandibular base is placed into position, and the patient is asked to close, suck and swallow, and to repeat the latter action several times. The baseplates are carefully removed and, while the rims are held in occlusion, the proximity of the maxillary tuberosities to the ascending portion of the rami is noted. If a further reduction of the vertical dimension is required, the posterior portions of the bases are thinned out to remove possible interferences, the lower rim is again resoftened, the lower base replaced and the patient is again asked to close, suck and swallow. This procedure is repeated until the previously accepted vertical dimension is recorded. The labiobuccal surfaces of the lower rim may now be trimmed to affect a proper contour restoration. Although this completes the registration of the vertical dimension it will again be checked when the centric relation record is made to see that the identical measurements prevail. Quite naturally when the wax model dentures are tried in, the vertical dimension should

be rechecked for the same reason.

The next clinical procedure is the registration of the positional relation of the jaws, and that of the denture space to the condylar axis. Because I prefer to use an adjustable articulator I also obtain a protrusive relation record. Both of these have been so fully described in our text books as to need no further comment here.[2, 3] On the other hand when we came to discuss the subject of centric relation we find it never fails to arouse plenty of interest. This has been true even in the days when we referred to this procedure as "getting the normal bite." Since those days there have been brought to our attention many different types of appliances and methods that were designed to aid us in obtaining better relation records. Each of these methods and prescribed appliances was proclaimed to enable one to obtain more accurate registration than those which preceded it. Yet in spite of all the thought, time and energy expended in efforts to bring about their adoption, we still find the prevailing tendency is a return to the old fashioned mush bite, and leave the rest to the laboratory technician. Is it perhaps that many men find these latter day methods too complex, or do they begrudge the time it takes to employ them?

A careful analysis of present day methods will reveal that basically there are but three methods of obtaining this registration. These are the static and the graphic method, and some combination of these two methods. This statement may also give rise to a bit of controversy. Once more it is necessary to realize that before an attempt is made to obtain a registration we should make certain that we understand what it is that we wish to accomplish. The relation that we must record is the most retruded unstrained relation of the mandible, from which all mandibular movements normally start, and to which it returns after its excursion to the right or left lateral, the protrusive or any intermediate position. We also must incorporate into this record the acceptable vertical dimension.

For the past 25 years I have routinely and consistently used soft wax to obtain records of centric relation. For nine years prior to that time I had used the graphic tracing devices and methods as developed by Professor A. Gysi. In classes which I have conducted for more than 25 years, I have demonstrated a number of variations of the graphic methods. In consequence it might be admitted that I am at least somewhat familiar with these procedures. After all this experience, I am still in agreement with the opinion expressed by Rudolph Hanau that the graphic tracing method, in conjunction with that of the static registration employing soft wax, is an excellent combination. It was this combination method that I demonstrated at the Session of the American Full Denture Society at their meeting in February 1948, and the one that I recommend to those who desire to employ some form of the graphic methods. I feel that as much can be accomplished by its use as by any of the other more intricate procedures. Because in most cases in which I have employed it I have found I was able to register the identical relation, I still persist in relying on the wax record for most of my cases.

Registration of Centric Relation

When the desired vertical dimension has been registered satisfactorily, the height of the mandibular rim is reduced from 2 to 3 mm. to provide space for the wax used in obtaining the records. Next the face-bow record is obtained and laid

2. Schlosser, Rudolph O., *Complete Denture Prosthesis*, ed. 2, Philadelphia, W. B. Saunders Co., 1946, pp. 204-207.

3. Swenson, Merrill G., *Complete Dentures*, ed. 2, St. Louis, C. V. Mosby Co., 1947, pp. 284-292.

Professor Emeritus, Northwestern University Dental School.

aside. This is followed up by obtaining a wax record of the protrusive relation. This record is hardened by placing it in cold water and, when it is replaced in the mouth, the patient is instructed to protrude and bring the surface of this record into occlusion with the upper rim. With the aid of this record he is told to hold the mandible in protrusion for from two to five minutes; this will produce a muscular fatigue which in turn will cause the patient to permit the mandible to return more readily to its rest position. It is this reaction that greatly facilitates the obtaining of the centric record.

The protrusive record in now removed, to be used later in the adjustment of the articulator condylar controls. A freshly softened roll of wax is then placed on the lower rim, the baseplate is returned to its position on the ridge, and the patient is asked to relax, close, suck and swallow; and after repeating the latter action several times, the wax record thus obtained is hardened by injecting a stream of cold water. It is removed and placed in water till it becomes thoroughly hard, after which it is replaced in the mouth to be checked.

While the patient is holding it in occlusion the vertical dimension is rechecked to see that it is identical with the previously obtained measurements. Next it is scrutinized to see that as the occlusal surface of the record meets the opposing surface of the upper rim, there is a simultaneous contact over the entire closing area. The patient is then asked if he senses an even pressure over this area, and lastly a test is made to see that the patient can tense the temporal muscles. When all these tests check positively, the record is judged acceptable.

Mounting Casts on Articulator

In the event that these registrations were made with impressions, the latter are first boxed in. The casts are poured and when they have hardened they are mounted on the articulator, and the condylar guide indications adjusted and set. Thus the vertical dimension along with the casts in their recorded relations have been transferred to the articulator. The incisal guide pin is now firmly locked so as to maintain the vertical dimension, and the tracing devices are attached to the rims built up to the same dimension. The thickness of bases is checked to see that it offers no interferences to free mandibular movements. If the impressions were employed instead of baseplates in obtaining the wax records, it is of course necessary to remove these carefully if it is planned to use them for making the graphic tracings, otherwise it will require that new baseplates and properly occluding rims be made for this purpose.

This is usually the case when, because of the presence of severe undercuts or irregularities in ridge form, it is difficult to remove the impression bases intact. In such cases it is advisable to make the new lower baseplate, attach a modeling compound rim to it and occlude it with the opposing upper rim in such a manner as to retain the acceptable vertical dimension before removing the upper impression. Then the upper impression is separated from the cast, and the new baseplate made over it and an occlusal rim attached and molded to make proper contact with the lower rim. If the incisal pin had been screwed tight and kept so, this action will have constituted a metallic record of the vertical dimension throughout.

At this stage the tracing appliances are affixed securely to the rims and their mounting carefully scrutinized to see that there is no interference present to prevent free lateral and protrusive movements. The baseplates are now placed in the mouth and the Gothic arch or arrow point tracings are obtained, after which the bases are returned to the articulator. It will be found that the modeling

compound rims hold the tracing devices much more securely than is the case with wax rims. There is also less chance for their distortion which might alter the vertical dimension.

If upon inspection it is found that when the bases have been replaced on the articulator the pointer rests directly on the apex of the tracing, both of the registrations have recorded the identical relation and no remounting of the lower cast is necessary. Such favorable coincidence is rarely encountered when less well-fitting bases are employed. Since the tests made with the wax record of centric relation revealed an overall simultaneous contact and a uniform pressure distribution along with the incorporation of the accepted vertical dimension, there was no need for employing the central bearing stud to stabilize the denture bases during the tracing operations.

The pointer resting on the apex of the tracing merely serves to indicate that the mandible, having made numerous excursive movements to right and left as well as to protrusive positions, had returned to centric relation. Since one of the causes to blame for resorptive changes of ridges under dentures is the failure to register centric relation correctly, my hope is that the emphasis I have placed upon it may be of some help to others in the profession in coping with this problem. Obviously, unless we obtain a correct centric relation record it is impossible to develop good occlusions, and malocclusion in denture prosthesis is not known to have been included by Shakespeare among the consummations devoutly to be wished.

Tooth Form and Arrangement

To continue with the established order brings us to the subject of tooth form and arrangement. It would indeed take an unlimited amount of time to combat all the arguments that have been brought forward condemning the use of anatomical form, particularly if the teeth in question happened to be made of unyielding porcelain. Yet in my clinical experience I have had patients return after having worn dentures with such teeth anywhere from five to fifteen years in which no unreasonable amount of destructive changes were evident. This has convinced me that much of the blame that has been placed on the use of this type of tooth has not been placed where it belongs. The argument that teeth can be set up on barn door hinges to function as effectively as those that have been carefully arranged on an individually adjustable occluding frame or articulator is, to say the least, rather far-fetched.

Destructive changes will not be produced if teeth are arranged in compliance with the esthetic and physiological needs of the patient, and if when they have been permanently fixed in the completely processed denture, they are mechanically modified to establish perfectly balanced occlusions for all functional positions and all interferences to free mandibular movements are eliminated. It also should be mentioned that care in the investment of the model dentures, in the packing of the denture resins, and in the processing and polishing are additional factors that may help to retard the resorptive changes we have been discussing because they will all contribute to better fitting dentures.

Servicing and Check-Up

Lastly it is necessary to say something about servicing the dentures after their initial insertion and the benefits that will accrue to the patient if he is recalled periodically for a check-up and such corrective adjustments as may be found necessary. Remember that those involved biological factors are still present and deserve further attention.

The edentulous patient has frequently been referred to as a cripple, which in truth he is. But if we tell him to look

upon the dentures as a sort of crutch, let us stand by him and help him all we can by teaching or instructing him how to make the best possible use of these newly acquired possessions. In most cases the crippling has come on him more or less gradually. It began with the neglect of the first cavity that forced him to modify his habits of mastication. Progressively his condition grew worse; this we find is often the case in patients who have done the best they can with such aid as we were able to give in retaining their natural teeth. The longer the patient persists in trying to function with a badly broken dentition, and the further he prolongs his partially or completely endentulous state, the greater will be the difficulty to which we, upon whom he calls for help, will have to apply our knowledge, skill and patience.

One of the greatest mistakes many of us make is to endeavour to alleviate the condition merely by inserting a set of dentures in the patient's mouth and telling him the rest is up to him.

While the more robust type of patient will often deem it unnecessary to return to have his dentures checked because of the fact that he is not conscious of any imperfections, it may nevertheless be found upon inspection that some slight overextension or occlusal disharmony is traumatizing the tissues and should be corrected.

On the other hand, the less robust elderly patients will require a closer supervision and receive correspondingly greater benefit from more frequent check-ups and corrections. Not only will this type of service add greatly to the comfort of the patient, but it will aid in retarding degenerative changes and in consequence materially prolong the effective service life of the dentures.—*55 E. Washington Street.*

ELIMINATION OF FATIGUE FOR THE DENTIST

Edgar W. Swanson, D.D.S., M.S.D., Chicago

THE LEADERS OF the dental profession, dental educators, government officials and the general public are aware that there is a shortage of dental man power. The dental man power presently available is measured or estimated on the basis of the number of practicing dentists and the number of hours of service in an average working day. No consideration is given to the dentists who are absent because of physical disability, or to those whose output is reduced by fatigue.

Several members of the faculty of Northwestern University Dental School have for some time been keenly aware of the reduction in professional service caused by undue fatigue and by physical disabilities rather common to dentists and decided it was time to do something about it. An interested committee of the faculty is, therefore, making a study and

From Northwestern University Dental School, Chicago.

evaluation of its possibilities and has initiated a program for "The Elimination of Fatigue for the Dentist."

On April 5, 1947, a symposium entitled, "Elimination of Fatigue for the Dentist" was presented at a meeting of this faculty to discuss this subject. The participants in this program were Emil Hauser, nationally known orthopedist; Carroll W. Johnson, a practicing dentist who has spent much time in the scientific study of operating from a seated position, and myself.

There was general agreement among the speakers, and in the discussion that followed, that the practitioner or student would be greatly benefited if a part of the work at the chair could be done from a sitting position, and that the percentage of daily service rendered by using an operating stool would vary with each operator and the type of operation performed. This changing of positions during the day is extremely important, as is borne out from an excerpt of Dr. Hauser's talk:

> The dentist by occupation is subject to fatigue, stress and strain, all of which brings him to the attention of the orthopedic surgeon with pain and disability in his back or deformities and discomfort in his feet and knees. The best treatment for these conditions is prophylactic. Periodic rest, regular vacations, planned avocations, and operating from a sitting position whenever possible, which changes the posture and relieves the tension of the dentist while operating, are most valuable. Planning the day to alternate the type of work has been found useful. Teaching the dental student to work from a sitting position is a long stride in the right direction.

At the conclusion of the meeting, the faculty enthusiastically passed a motion to adopt a program of training students to operate from a sitting position as well as the conventional standing position, and to explore further possibilities for the reduction of fatigue.

As the basic teaching of all technical operative procedures is conducted in the Operative Technic Laboratory, it naturally follows that this is the proper place to inaugurate the training of the student to use an operating stool. Standard four legged stools were purchased and added to each of the dentech units in the laboratory which are adjustable to all positions and heights. The sophomore students were then taught to prepare all types of cavities in natural extracted teeth; insert fillings of gold foil, gold inlays, amalgam, silicate, cement and guttapercha; root canal therapy and prophylaxis.

Thus far, it is not mandatory that any specific operating be done from a seated position. The stool is there and the student is instructed in its use. The students in the laboratory use it about 60 per cent of the time and the students in the clinics vary from 10 to 90 per cent per operation. The observation in the clinics at the present time is limited because there are only 35 chairs equipped with operating stools. It is interesting at this point to note that ten of the students in the clinic are so enthusiastic about this project that they have purchased various types of operating stools for themselves.

In order to obtain more accurate information on the reaction of students in the clinics who had used an operating stool, the following questionnaire was presented to the senior class. No comments or suggestions were made relative to their answering the questions and they were asked to return the form unsigned to one of the clinic clerks during the ensuing week. (This class had had no laboratory training in the use of an operating stool.)

1. Do you feel as tired at the end of the day when you have used an operating stool as you do when you have operated from the conventional standing position?

All but three answered "no." (Two of those answering "yes" stated it may have been due to their limited experience with the use of a stool.)

2. Do you like the idea of sitting while operating?

All answered "yes."

3. Would you do more operating from a sitting position if more stools were available?

All answered "yes."

4. If you had a stool in your own office, what per cent of the time do you think you would use it?

The answers ranged from 10 to 90 per cent. The majority answered, "about 50 per cent."

5. In what area of the mouth do you find it most difficult to operate from the following positions:

(a) Standing.

(b) Sitting.

Question 5 proved most interesting. It was asked with the thought in mind that we would give additional instruction covering the most difficult areas in both the standing and sitting positions. While one would expect all areas of the mouth to be mentioned, it was interesting to note that the same area was most difficult for the same operator whether he was standing or sitting.

The upper right posterior region was voted the most difficult, seconded by the upper left and lower right areas which were about equally divided.

Fatigue is not an ailment that comes with age or after many years of practice. A recent report by Austin and Kruger[1] from the Mayo Clinic bears this out. This report is a survey of the dentists who came as patients to the Mayo Clinic in 1940, which was a prewar and postdepression year, when business conditions might be said to be reasonably normal, and before the dentist was called upon to render the extra service of the war and postwar years. Forty-five per cent of this group were under 45 years of age. Of this younger group, the largest number (23.8 per cent) presented themselves because of exhaustion. If the cases of duodenal ulcer, usually the product of tension and irritability resulting in exhaustion, were added to the cases of exhaustion the total would eclipse any other group of conditions in the survey. Only 14.6 per cent of the group over 45 years of age were in this category. This would seem to indicate that the older men had learned to adjust themselves to the confinement of operating at the chair by perhaps working fewer hours, by learning to operate from a stool and by taking advantage of other means of resting and relaxation.

In addition, when one is standing for long periods at a time such as the dentist is required to do every day, it creates an extra load on the heart. Field and Bock[2] of the Massachusetts General Hospital reported,

> The slowing of the circulation was more marked in the standing than in the sitting position. The average rate of flow while sitting was 76 per cent and while standing it was 50 per cent of the rate while reclining. Inasmuch as the pulse rate increased from an average of 63 per minute in the reclined position to 65 per minute in the sitting position, and 90 per minute in the standing position, the output per beat was tremendously diminished in the upright posture. While standing it amounted to only 35 per cent (an average) of that while reclining. This is also indicated by the blood pressure findings. After the subject had been standing for a time the pulse pressures were greatly diminished, often to 5 or 10 mm. of mercury, and sometimes the auscultatory vascular sounds were almost inaudible.
>
> The obvious explanation is to attribute the change in blood flow to an effect of gravity which, in the upright position, produces a stasis of the circulation in the legs and splanchnic area which results, consequently, in a diminished supply of blood to the heart . . .

What effect this program will have upon the dental profession in the future can only be projected from the many favorable comments which have come from members of the profession from all parts of the country. In the belief that

1. Austin, L. T., and Kruger, G. O., Common Ailments of Dentists. *J.A.D.A.* 35:797 (Dec.) 1947.

2. Field, H., Jr., and Bock, A. V., Orthopnoea and the Effect of Posture Upon the Rate of Blood Flow. *J. Clin. Investigation* 2:67 (Oct.) 1925.

the use of an operating stool will add several years of service to the life of the average dentist, we are suggesting that it be used about 50 per cent of the time. "One of the most constructive suggestions for the profession to come out of a dental school in a long time," and "Wish I had had the opportunity while a student in school to have been trained to operate from a stool," were two of the most common remarks received from practitioners.

While it is recognized that many factors can contribute to the production of fatigue of the dentist, the matter of posture has not received all of the attention that it should. It seems not so much a matter of either sitting or standing as it does of *changing* one's position at the chair, thus resting one group of muscles, while another works. To accomplish this purpose, it becomes necessary to learn to operate while sitting as well as while standing. It is with this objective in mind that Northwestern University has embarked on a program of providing the facilities whereby the student can learn to do both. It seems reasonable to conclude that by helping the student to operate with greater relaxation, both the dental profession and the public are benefited.—*25 E. Washington Street.*

THE PERIODONTAL MEMBRANE IN ORTHODONTICS

Robert E. Moyers, D.D.S., Ph.D., Toronto, Canada

Most orthodontists agree that no one appliance can perform in a perfect manner all the various desired tooth movements. Each has its insufficiencies and though individuals champion their favorites and point out the shortcomings of other devices and systems few would say that the ideal orthodontic mechanism has yet been evolved. Orthodontists are well aware of these mechanical limitations in their treatment procedures, for the literature abounds with new brackets, archwires and gadgets presented to the profession to overcome present inadequacies and restrictions. They speak loosely of what one appliance or another can do in the way of moving teeth as if the appliance itself were the sole limitative factor. Perhaps it would be more correct to speak of what the periodontal membrane will allow one appliance to achieve and what it will not permit another.

By setting up artificial teeth with their roots imbedded in wax and an appliance in place on their crowns it can be proved, when the wax is heated, that all sorts of movements can be effected. Insert the same mechanism in the mouth and the results are often painfully different. Where is this inconsistency? Do not the same mechanical principles apply *in vivo* as *in vitro?* They do to be sure, with very specific biologic restrictions. It is the pur-

Professor and Head of the Department of Orthodontics, Faculty of Dentistry, University of Toronto, Toronto, Ontario, Canada.

pose of this paper to discuss these physiologic limitations and the tissue responsible for them.

From the classic research efforts of Oppenheim,[1] Gottlieb and Orban[2] and many others considerable is known about the histopathology of bone during tooth movements. The concomitant resorptive and depository processes are understood; the rearrangement of the trabeculae, the site of the fulcrum and so forth have been explained. However numerous facts are yet to be learned about the initiation of this physiologic response in the bone. What appliance will move the teeth in a dry skull? None certainly, for the periodontal membrane which determines all tooth movements is absent. What is the role of this tissue in orthodontics? How does it limit therapy? What is its response to orthodontic pressures?

Situated as it is between the root and the alveolar bone, the periodontal membrane acts as the tooth's natural shock absorber. Without it crown fractures would be much more frequent and chipped enamel on the incisal edges of teeth would be commonplace. The principal fibers serve as suspensory ligaments allowing the tooth to move a small but perceptible amount during biting and mastication. More important for the orthodontist, this membrane is made up of the connective tissue from which are generated the cells that make tooth movements possible. Little is known as yet about this generative process, but both osteoclasts and osteoblasts have their origin in connective tissue and without these transient osseous cellular elements the specialty of orthodontics would not exist. The maintenance of good capillary function in the periodontal membrane is of prime importance to the orthodontist since an adequate nutrient blood supply is necessary to bring about the genesis of osteoclasts and osteoblasts. The blood supply of the periodontal membrane arises from three sources: (1) periapical vessels from the medullary spaces of the bone; (2) vessels which feed the membrane from the gingival mucosa and periosteum, and (3) vessels which enter the membrane from the alveolar wall. Much anastomosing of the membrane's vessels account for the rather uniform size of the lumens throughout the length of the tooth's root. This anastomotic character of the capillary bed has orthodontic meaning as well for if one of the sources of blood supply is cut off, the remaining vessels can still bring about repair and regeneration.

What actually happens when first an orthodontic force presses the tooth against the periodontal membrane? The lightest force showing compression of the periodontal membrane will demonstrate a straightening of the fibers on the opposite side of the tooth (Fig. 1). When vessels are caught between fibers thus being stretched they assume an oval appearance. This straining of the periodontal fibers is the initiating mechanism for the realignment of the alveolar trabeculae which condition was termed transitional bone by Oppenheim.[1] There will be some lessening of the blood flow on the tension side of the tooth but a much greater tendency for this to occur will appear on the pressure side. In fact very little force is required to bring about actual stasis in the periodontal vessels. When stasis occurs, and the percentage of occurrence is high with most orthodontic appliances, it means that a portion of the membrane must undergo strangulation, necrosis and regeneration before actual tooth movement will be started. In other words stasis of the periodontal blood flow is the first indication of the pathologic change which makes tooth movements possible. This then is the general picture in the membrane before the resorptive and depository processes have

1. Oppenheim, Albin, Tissue Changes Particularly of the Bone Incident to Tooth Movement. *Am. Orthodontist* 3:57, 1911.

2. Gottlieb, Bernhard, and Orban, Balint, *Die Veranderungen der Gewebe bei übermassiger Beanspruchung der Zahne*. Leipzig: George Thieme, 1931.

begun. However, the picture varies with the manner of force application and the way in which the tooth is to be moved.

When a tooth is tipped the blood supply is endangered. The sole reason permanent damage is not done in such cases is the rich amount of anastomosing of the vessels. The membrane is crushed at the alveolar crest on one side and just above the apex of the root on the opposite side unless the very lightest pressures are used. However, the necrotic material is carried away and regeneration of the membrane is begun in due time since collateral circulation can easily be established when only tipping has taken place (Figs. 2 and 3).

When the orthodontist attempts bodily movement of teeth he is faced with a very different problem. By bodily movement is meant the simultaneous movement of the crown and apex of the root in the same direction. When true bodily movement is undertaken all three sources of blood supply for the periodontal membrane are cut off on the side of pressure. In addition there is a general lessening of the rate of blood flow in the tension side. Thus the danger of real damage is greater as compared to the simple tipping of teeth, since all the possibilities of collateral circulation are removed. The clinical response to bodily movement is much slower because a larger region of regeneration must be undertaken before movement can begin. The phrases "limbering up the tissues," "obtaining bracket engagement," "getting the teeth used to

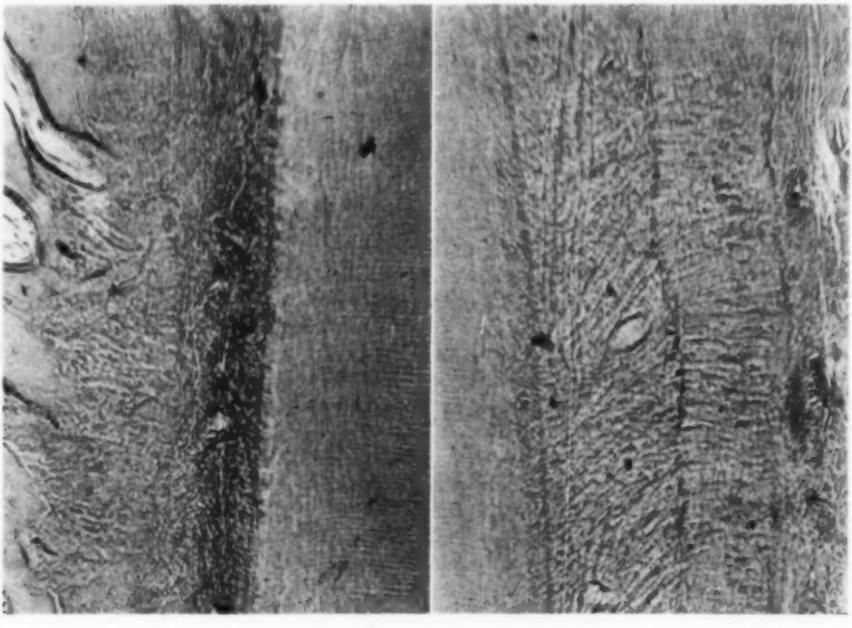


Fig. 1.—Immediate response of the periodontal membrane to orthodontic forces. An edgewise mechanism exerting 150 Gm. for 30 minutes. Left, compression and right, stretching at the same level. Note the absence of any changes in the bone structure and the presence of only normal amounts of osteoblasts and osteoclasts

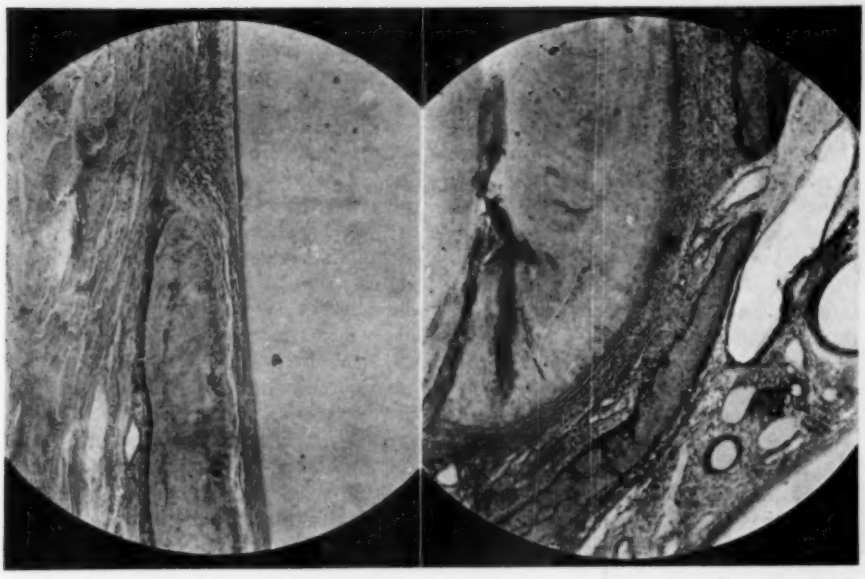


Fig. 2.—Photomicrograph of a tooth tipped by a twin wire mechanism. Initial force 80 Gm., duration of force 28 days. Left, gingival crest showing compression of periodontal membrane. Right, opposite side of tooth showing compression in the apical region. Note the similarity of bone response in the two regions

the appliance" and "waiting for the teeth to move" simply refer to the period during which the periodontal membrane is undergoing necrosis and regeneration and the transient osseous cellular elements are making their appearance in ever increasing numbers. During bodily movement of teeth this period is of necessity longer and this terminology is most frequently used by those men employing appliances which can actually effect bodily movement of teeth.

From these facts it may be concluded that while bodily movement of teeth may often be more desired from a mechanical standpoint, it is difficult to attain physiologically and the entire procedure is fraught with danger. This does not mean bodily movements are not to be undertaken: it does mean care and caution must be exercised to a great degree. Bauer and Moyers[3] have shown that actual bodily movement of teeth can be attained with several appliances in common usage. Unfortunately though, the only ones which grasp the tooth in such a manner as to permit bodily movement are the ones most difficult to use gently. The ribbon archwire, edgewise arch mechanism and universal appliances will definitely effect bodily movement: this has been proved. These same appliances will traumatize the periodontal membrane to a homogeneous pathologic mass unless properly manipulated: this too is a well known fact. Quick regeneration of this tissue is prevented by the very appliance which so efficiently brought about the tooth positioning. Bodily movement of teeth can be carried out successfully and it is not the appliances which impede this

3. Bauer, L. J., and Moyers, R. E., Experimental Bodily Movement of Teeth. To be published.

procedure so much as it is the nature of the periodontal membrane itself.

Every orthodontist who has treated a patient knows that intrusion of teeth is most difficult. It is tried on case after case of labioversion of the maxillary anterior teeth with something less than striking success. Here again the orthodontist is faced with the problem of nutrition of the periodontal membrane. The formation of the bony alveolus is such that continuous intrusive forces against the teeth shut off the circulation that makes tooth repositioning possible. When a force acting parallel to the long axis of the tooth is applied the entire surface area of the periodontal membrane is compressed against the bone. It will have to be regenerated in its entirety and resorption must take place over the entire alveolus before movements can be realized. The finest designed appliances in the world cannot avoid these simple physiologic facts. It is not difficult to visualize why intrusions are often tedious orthodontic maneuvers.

Reverse conditions prevail in effecting extrusive movements. They can often be quickly brought about by bite planes or other devices which take the teeth out of occlusion and by routine appliance attachment methods. The insertion of a Hawley retainer with a bite plane in the anterior region will often cause the posterior teeth to extrude though they are not banded or attached to the archwire.

All of this emphasis on the role of the periodontal membrane in orthodontic procedures leads to these questions: how can its status be determined? Are any criteria available for ascertaining the health and condition of this tissue? There is some indication that the periodontal

Fig. 3.—Tension side of gingival crest of a tooth to which 50 Gm. of force have been applied for 35 days. The appliance was a round wire finger spring

membrane displays evidence of severe nutritional deficiencies in a manner similar to that of the oral mucosa. It can be fairly assumed that any endocrine disturbances of a degree sufficient to be demonstrable in the gingivae are affecting the periodontal membrane as well. Most particularly is it certain that localized infections and lesions of the gingival tissues are indicative of periodontal conditions which will impede and hamper orthodontic progress. The membrane itself cannot be observed directly, but neighboring tissues can. When they present pathologic conditions or are in ill health, the periodontal membrane cannot function normally. Therefore, the key to the matter is to observe with a critical and discriminating eye the oral mucosa and other soft tissues of the mouth as well as the condition of the bone and cementum in roentgenograms. These tissues have a common environment with the periodontal membrane and a similar source of nutrition; hence they offer one of the best available indexes of the health and status of the periodontal membrane itself.

Severe nutritional deficiencies rarely occur in the United States at the present time. Many investigators believe that the incidence of hormonal gingivitis in children is especially low. This is helpful for it points to the fact that, while the soft tissues may be in a state of poor health, in most instances this condition can be treated with success prior to orthodontic procedures.

In those cases which are presented with oral pathologic lesions or in which the oral mucosa is not in the best of health, these steps should be taken: (a) examine the intraoral roentgenograms for regions of bone resorption and radiolucency; (b) institute proper therapeutic procedures for the treatment of the condition, and (c) wait a sufficient length of time to insure a normal picture of both the mucosa and bone before instituting orthodontic therapy. Have no hesitancy in reporting to parents the reason for the delay and by all means describe the condition and the therapeutic procedure in detail in the orthodontic case history; it may be the sole explanation of apparent failure later.

No discussion of the periodontal membrane and its role in orthodontics could be made at this time without mentioning the problem of its survival after extractions. The present tendency of some dentists to remove dental units almost routinely in their treatment procedures has centered attention once more on this tissue. Erikson, Kaplan and Aisenberg[4] have shown that the transeptal fibers persevere after the extraction of first bicuspids to such an extent that normal contact between the cuspid and second bicuspid should not be expected. This is not a blanket contraindication of all therapeutic extractions, but is another manifestation of the domineering role the periodontal membrane plays in orthodontics.

Much is yet to be learned about the periodontal tissue. Yet all orthodontists can be certain of this much: no single factor limits and controls their therapy so much as the physiologic response of the periodontal membrane to induced pressures and strains. It determines whether tooth movement is possible or not, at what rate and manner and, to some degree, whether the tooth will retain its new position. Until the time comes when research has made available knowledge which will insure the success of each and every orthodontic endeavor, it seems prudent to treat this tissue with the respect it deserves and demands.

4. Erikson, B. Edwin; Kaplan, Harry, and Aisenberg, Myron S., Orthodontics and Transeptal Fibers. *Am. J. Orthodont. & Oral Surg.* 31:1 (Jan.) 1945.

SOME PUBLIC HEALTH ASPECTS OF PERIODONTAL DISEASE

Neal W. Chilton, D.D.S., M.P.H., Trenton, N. J.

More and more attention is being directed toward organized efforts to improve the health of the people of this country. Dental health is generally recognized as an integral part of the overall public health picture. Within the field of dentistry, periodontology is relatively young, and little has been done regarding the inclusion of this aspect of dental science in the public health thinking pattern. It is the purpose of this article to present and evaluate existing information pertinent to the public health aspects of periodontal disease.[1]

According to Mustard:[2]

> A health problem becomes a public health responsibility if or when it is of such character or extent as to be amenable to solution only through systematized social action. Its relative importance varies with the hazard to the population exposed. This hazard may be qualitative, in terms of disability or death; quantitative, in terms of proportion of population affected; it may be actual or potential.

In order to discover the character and extent of periodontal disease, standardized criteria must be established for its clinical evaluation in large population groups. A terminology will have to be evolved so that interchange of ideas and information among different investigators will be possible. Some progress has been made in this country in standardization of nomenclature, largely through the efforts of the American Academy of Periodontology and the American Dental Association.[3] Similarly, efforts are being made to establish a classification system that will be both widely accepted and readily applicable.[4]

Terminology and classification procedures cannot be applied unless the presence of the health problem is recognized. As will be presented later, periodontal diseases result in the loss of a great number of teeth. Since loss of teeth is the end result of progressive periodontal destruction, it is reasonable to assume that a great many persons have earlier stages of periodontal breakdown. With the exception of cases of alveolar atrophy in the young due to systemic dysfunction, where the prognosis is poor, it is almost axiomatic that the earlier periodontal disease is recognized and adequate treatment instituted, the better the prognosis.

Probably the chief reason for lack of recognition of early periodontal disease is that it usually presents no subjective symptoms, such as pain or discomfort, which would influence the patient to seek dental service. The dental profession is not entirely without blame, however, in the failure to recognize early signs of periodontal disease. A hasty examination may fail to disclose roentgenographic alterations in the appearance of the alveolar crests and lamina dura, which often are the first evidence that periodontal

Read at the annual session of the American Dental Association, Chicago, September 16, 1948.

Section on Dental Diseases, New Jersey State Department of Health, Trenton, N. J.

1. In this article, periodontal disease will include all affections of the gingivae and tooth-supporting structures.

2. Mustard, H. S., *Introduction to Public Health*, ed. 2. New York: Macmillan, 1945, p. 12.

3. Report of Nomenclature Committee, American Dental Association. *J.A.D.A.* 30:1112 (July) 1943.

4. Committee on Nomenclature, American Academy of Periodontology, Nomenclature in Periodontia. *J. Periodont.* 18:112 (July) 1947; 19:147 (Oct.) 1948.

breakdown has occurred. Although diagnostic methods for the detection of early periodontal breakdown are readily available, they may not be utilized, either because the patient fails to realize that early stages of many types of periodontal disease usually do not cause pain and discomfort, or because the dentist lacks sufficient interest or knowledge. When there is widespread failure to detect the existence of early periodontal breakdown (and we have reason to believe that there is), then large population groups are affected and a public health problem is created.

Prevalence of Periodontal Disease

When a disease or group of related diseases is described, not only the pathology, etiology, treatment and prognosis are included, but some idea of the distribution of the condition is considered essential. The concept of the "distribution" of disease embraces the incidence (how many new cases per given period of time; the attack rate) and the prevalence (the total number of cases existing at any one time), in the over-all population. The distribution may be further analyzed with respect to such factors as age, sex, race, economic status, geographic location, intensity of periodontal involvement, occupation and variations in attack on different teeth. Together, all this information constitutes the epidemiologic characteristics of a disease or group of diseases.

Epidemiology originally referred to the study of epidemics, or of disease characterized by a sharply increased case incidence within a relatively short period of time. During the past generation, according to Dean:[5]

> The science of epidemiology has been so expanded that the term has become connotative of the study, as a mass phenomenon, of any human disease, actual, suspected or assumed. In studying a disease or condition by the "epidemiological method" a population of individuals constitutes the unit of investigation. This is in distinct contrast to the clinical method in which the individual, rather than a population of individuals, is the basis of study. In an epidemiological inquiry, all observations are related to the group; in a clinical study, the observations remain related to the particular individuals under study.

It would be advantageous to present reliable data on the distribution of the various types of periodontal disease with respect to the characteristics previously mentioned. This, unfortunately, is not entirely possible, since there is very little information of a statistically reliable nature on the epidemiologic characteristics of periodontal disease. The reasons have been mentioned—lack of uniformity in terminology and classification and inadequacy of diagnoses, to which may be added lack of application of reliable statistical methods.

Data obtained from examination of patients who seek dental treatment cannot be applied, with any accuracy, to the general population. While it is true that such information is obtained from a biased sample, and that the exact nature of the bias cannot be accurately determined, at least these data would give some indication of how the periodontal disease affects a limited part of the population. With this in mind, and realizing the limitations imposed by differences in terminology, classification and diagnosis, some information can be presented.

In a recent article Schour and Massler[6] reviewed the literature on the prevalence of gingival disease. Their observations will convey some idea of the diversity of data on the prevalence of one type of periodontal disease:

5. Moulton, F. R. (editor), *Dental Caries and Fluorine*, ed. 2. (Dean, H. T., Some General Epidemiological Considerations). Washington, D. C.: American Association for the Advancement of Science, 1946.

6. Schour, I., and Massler, M., Gingival Disease in Postwar Italy (1945): I. Prevalence of Gingivitis in Various Age Groups. *J.A.D.A.* 35:475 (Oct. 1) 1947.

An examination (of the literature) shows the wide range in the prevalence of gingival disease reported by various observers for various geographic areas. The prevalence for similar age groups ranges from 8.8 per cent for children 4 to 16 years old in the United States to 90 per cent for children 6 to 15 years of age in the Isle of Lewis. Furthermore, similar groups (21 to 30 years of age) within Great Britain show a range of prevalence from 34 per cent to 84 per cent. It is apparent that there is no general agreement on what constitutes gingival health and gingival disease and that therefore the wide range of prevalence (8 to 90 per cent) is a result of different criteria employed by observers rather than a result of actual difference in prevalence.

In a recent unpublished study in Michigan, it was found that the incidence of gingivitis was 8.5 per cent for children 5 to 17 years of age.[7] While the basic difficulties in the application of public health methods to periodontology are again pointed out, it can be seen what valuable information could have been obtained from all the studies cited if reliable standardized public health methods had been utilized.

Even greater problems are posed by a consideration of the prevalence of other types of periodontal disease in which alveolar bone destruction has taken place. Diagnosis of destruction of alveolar bone is based largely on roentgenographic evidence, at least in the earlier stages. Unless patients have sought dental care, no roentgenograms would have been taken, so that any available information is drawn from a biased sample. An over-all picture of the prevalence of periodontal disease can perhaps be obtained from a study of 500 fighter pilots of the American Army Air Forces, which included roentgenographic examination, in which 29.2 per cent had some form of periodontal disease.[8] As these men were the select of the population, relatively young and in excellent health, this figure gives some idea of the widespread nature of periodontal disease.

Sex Distribution

There have been many conflicting statements about the sex distribution of periodontal disease. Of course, periodontal disturbances based on the endocrine changes which occur during pregnancy or menstruation would be limited to women, but beyond that the influence of sex on periodontal disturbances has not been definitely established. In the 1,003 cases analyzed roentgenographically by Miller and Seidler,[9] 62 per cent of the males and 56 per cent of the females needed periodontal treatment. A study of the dental needs of American adults conducted by the Committee on Economics of the American Dental Association,[10] showed that there was a slightly higher percentage of men needing periodontal treatment than women, on the average, in each economic group. The average percentage of patients requiring "pyorrhea treatment" increased with increasing income, the highest figures being 16.7 per cent for men and 14.1 per cent for women.

No reliable data are available on the effects of race or occupation on the incidence of periodontal disease, although it is known that occupational hazards or habits may be an etiologic factor in periodontal breakdown.[11]

Tooth Susceptibility

Miller and Seidler[12] studied the roentgenograms of 500 patients and con-

7. Bureau of Public Health Dentistry, Michigan Department of Health, Study of Dental Conditions of Michigan Children. Lansing, 1947. Unpublished.

8. Burket, L., *Oral Medicine* (Goldhush, A. A., Oral Aspects of Aviation Medicine). Philadelphia: J. B. Lippincott, 1946.

9. Miller, S. C., and Seidler, B. B., A Correlation Between Caries and Periodontal Disease. *J. D. Res.* 19:549 (Dec.) 1946.

10. Walls, R. M.; Lewis, S. R., and Dollar, M. L., *A Study of the Dental Needs of Adults in the United States*. Chicago: Committee on Economics, American Dental Association, 1940.

11. Schour, I., and Sarnat, B., Oral Manifestations of Occupational Origin. *J.A.M.A.* 120:1197 (Dec. 19) 1942.

12. Miller, S. C., and Seidler, B. B., Relative Alveoloclastic Experience of Various Teeth. *J. D. Res.* 21:365 (Aug.) 1942.

cluded that different teeth were attacked with varying degrees of intensity by alveolar breakdown. They classified the teeth into three broad categories of susceptibility to alveolar breakdown, in ascending order:

Group 1. Maxillary and mandibular first and second bicuspids and cuspids and the mandibular third molars.

Group 2. Mandibular first and second molars.

Group 3. Maxillary and mandibular first and second incisors, and maxillary first, second and third molars.

Tooth Mortality

Probably the most reliable information can be obtained from mortality studies of teeth extracted because of periodontal involvement, as compared with morbidity data (persons or teeth suffering from periodontal breakdown). Two studies of the causes of tooth extraction (tooth mortality) stand out, that of Brekhus in 1929 at the University of Minnesota[13] and that of Allen in 1944 at the University of Michigan.[14] Both studies appear to have been conducted in similar manner; the causes of extraction were listed for consecutive patients at the university dental clinics. The two studies appear to differ in that Brekhus' sample was about eight times as large as Allen's, and the age distribution of the latter's patients was more inclined toward the younger groups. From his data, Brekhus stated:

> Periodontoclasia sets in about 5 years earlier in women than in men, but when we pass the 30 year line, the loss from periodontoclasia is from ¼ to ⅓ greater in men than women. . . .

He concluded:

1. Caries and periodontoclasia are the two diseases responsible (directly and indirectly) for 96.62 per cent of the extractions. . . .
2. Periodontoclasia is more active in men than in women.
3. Caries is more active during the growing and developmental periods of life. Periodontoclasia sets in after maturity and increases with age.

Analysis of the data reveals that 32.2 per cent of all extracted teeth were removed for periodontal reasons in the 1929 study, compared with 40.7 per cent in the 1944 study. We note that the percentage of teeth extracted because of periodontal involvement increased with age, and that the distribution of the patients in Allen's study tended toward the younger ages. If we were to redistribute the total extractions in the later study according to the age distribution of the total extractions in Brekhus' paper, and then apply the age specific rates for extractions due to periodontal disease, we would find that the over-all, age-adjusted percentage of teeth extracted for "pyorrhea" would be increased to 46.7 per cent in Allen's study. From these data would it not be logical to assume that perhaps periodontal disease, as measured by tooth mortality, has increased during the years since 1929?

Age Distribution

Brekhus stated that "periodontoclasia" sets in after maturity and increases with age. While this may be true if we consider the loss of a tooth with periodontal involvement as the first manifestation of periodontal breakdown, our concepts now look at diseases of the tooth-supporting structures as being chronic in nature, starting many years before destruction has proceeded far enough to cause loss of teeth. Opinions expressed in recent articles[15-18] suggest that the basic patho-

13. Brekhus, P. J., Dental Disease and Its Relation to the Loss of Human Teeth. *J.A.D.A.* 16:2037 (Dec.) 1929.
14. Allen, E. F., Statistical Study of the Primary Causes of Extractions. *J. D. Res.* 23:453 (Dec.) 1944.
15. Brauer, J. C., Systemic and Local Factors in Periodontal Problems of the Child's Mouth. *J.A.D.A.* 30:45 (Jan.) 1943.
16. Thomas, B. O. A., The Child Patient as a Future Periodontal Problem. *J.A.D.A.* 35:763 (Dec. 1) 1947.
17. O'Rourke, J. T., Dental Care for Children in Relation to Geriatrics. *J.A.D.A.* 34:595 (May 1) 1947.
18. McCall, J. O., Gingival and Periodontal Disease in Children. *J. Periodont.* 9:7 (Jan.) 1938.

logic patterns which are manifested later as periodontal breakdown may be established during childhood. From a study at the Guggenheim Dental Clinic we find: "Roentgenographic examination of 123 random six and nine year old cases noted 30 per cent with alterations from clear-cut normal aspects of the alveolar crests."[19] Although the children coming to this clinic are selected on an economic basis, the data indicate that a high percentage of early periodontal breakdown may be evident in the younger age groups.

In 1918 Black,[20] reported on roentgenographic examination of 600 persons selected as a cross-section of "people as met on the street." Of those 20 to 24 years of age, 13 per cent showed alveoloclasia. In those more than 50 years of age, 88 per cent had roentgenographic evidence of periodontoclasia. More recently, Gilson at the University of Michigan[21] reported the following percentages of individuals in the various age groups with evidence of periodontal disease, using bone loss as the criterion:

Age	Per cent
11 to 20	22
21 to 25	37
26 to 35	65
36 to 45	85
46 and older	90 to 95

Vincent's Infection

Ulcerative necrotizing gingivitis (Vincent's infection) was included in the province of public health when it was considered a highly contagious disease and efforts were made by health authorities to prevent "epidemics of trench mouth" from affecting the general population. This concept is gradually being replaced, and today many authorities believe that the condition is essentially a secondary infection superimposed on a lowered tissue resistance, which in turn is caused by nutritional inadequacy, local traumatic factors or systemic influences.[22] In 1944, twenty-two states listed Vincent's infection as a reportable disease,[23] although it was found that such reporting was very poor, and that at least three states had removed or were considering removing this condition from the list of reportable diseases.[24]

Continuance of the concept of the communicability of Vincent's infection may definitely interfere with the advancement of public health dentistry. For example, it was found that one large city dental clinic listed 40 per cent of the services performed as treatments for Vincent's infection, while a neighboring city, with a nationally recognized dental program, listed only 0.5 per cent of its services as such treatment. The former city has a statute requiring successive negative cultures of Vincent's organisms for food handlers, while the latter city has no such law. Official health agencies should give serious thought to modifying their policies in this regard, otherwise they are apt to divert their energies and funds in the wrong direction.

General Health and Periodontal Disease

Although no definite data can be presented on the extent of the effects of periodontal disease on the health of the public, it has long been recognized that periodontal disease may have an influence on the general health of the individual, in addition to causing loss of teeth as an end result. Hilming[25] has recently

19. Krasnow, F., *Dental Clinics in Progress for Children's Dentistry*. The Murry and Leonie Guggenheim Dental Clinic, August 1947.

20. Black, A. D., Roentgenographic Studies of Tissues Involved in Chronic Mouth Infections. *J.A.M.A.* 71:1279 (Oct. 19) 1918.

21. Gilson, G. M., Graduate thesis, University of Michigan, 1948; Michigan Alumni Bulletin, August 1948.

22. Rosebury, T., Recent Developments in Fusospirochetal and Related Infections. *J. Periodont.* 17:121 (July) 1946.

23. Fowler, W., The Reportable Diseases. *Pub. Health Rep.* 59:317 (March 10) 1944.

24. Sebelius, C. L., Vincent's Infection—a Wartime Disease. *Am. J. Pub. Health* 35:451 (May) 1945.

25. Hilming, F., Chronic Ulcerative Gingivitis and Focal Infection. *Brit. D. J.* 83:49 (Aug. 1) 1947.

focused new attention on this phase by showing that successful treatment of one type of periodontal disease produced changes in such gross measurements of systemic illness as temperature and erythrocyte sedimentation rate. When it is realized that a much greater and more vascular area is involved in periodontal breakdown than in periapical infections, and that gingival pockets provide an excellent place for bacterial growth, it is apparent that there is a definite possibility of periodontal foci of infection.[26]

The Problem of the Future

The American people constitute an aging population, which means that periodontal disease, the advanced stages of which are manifested in the adult age groups, will assume even greater importance in the future. The population between the ages of 35 and 60 is expected to increase by 15 million between 1940 and 1980,[27] assuming no immigration, which will produce an even larger group in which the ravages of periodontal breakdown may occur.

Summary and Conclusions

Some of the epidemiologic characteristics of periodontal disease have been presented and the reasons for the paucity of pertinent scientific information on the subject have been discussed. The need for more information regarding the mass characteristics of periodontal disease beyond the basic fact that this condition is widespread in our population is stressed.

The limited information available suggests that because of the widespread prevalence of periodontal disease, and its increasing importance as a cause of tooth loss, periodontal disease may be a public health responsibility.

26. Miller, S. C., and Burman, L. R., Periodontal Disease as a Possible Focus of Infection. (Abstract) J. Am. Col. Den. 10:71 (March) 1943.

27. Statistical Abstracts of the United States. Bureau of Census, Department of Commerce. Washington, D. C.: U. S. Government Printing Office, 1947.

A COMPARATIVE STUDY OF PROXIMAL CAVITIES FOUND BY CLINICAL AND ROENTGENOGRAPHIC EXAMINATIONS

A. H. Trithart,* D.D.S., M.P.H., Jackson, Tenn., and
C. J. Donnelly,† D.D.S., M.P.H., Ann Arbor, Mich.

THE first dental roentgenogram was made within fourteen days after the announcement that the mysterious rays discovered by Dr. Roentgen would penetrate solid substances impervious to light. This honor fell to Dr. Otto Malkhoff of Braunschweig, Germany, who wrapped an ordinary glass plate in black paper, covered it with rubber dam, placed it in his mouth, and exposed it to these rays for twenty-five minutes.[1] In the following year, Dr. Edmund C. Kells, a dentist, began advocating the use of the roentgenogram in dental practices.[2]

*Regional Dental Officer, Tennessee Department of Public Health.

† Formerly graduate student in Public Health Dentistry, University of Michigan. At present dental officer, Michigan State Department of Health.

1. Ennis, L. M., Dental Roentgenology, ed. 2, Philadelphia, Lea & Febiger, 1936, p. 15.

Since then, great strides have been made in dental roentgenography until today the x-ray unit is standard equipment in the modern, scientific dental office. The operative dentist finds it essential for locating and determining the extent of proximal cavities. Although various estimates have been made, limited scientific study has been conducted to determine accurately the percentage of additional cavities found through the use of the roentgenogram.

Previous Investigations

Fixott[3] estimates that 25 to 40 per cent more cavities exist in children's mouths than can be found without the use of the roentgen rays.

While examining students, Delabarre[4] found 1,842 cavities with a mirror and explorer. A roentgenographic examination revealed an additional 1,960 decayed areas.

In a study made on naval aviation cadets, White[5] reported that bitewing roentgenograms disclosed 4.4 carious areas per patient, and that only 13 per cent of the group could have been rehabilitated completely without the aid of the bitewing film.

Smith,[6] comparing the results of clinical and roentgenographic examinations on 210 children, found that the bitewing roentgenograms revealed additional cavities in 67.6 per cent of the patients.

In New Zealand, Barr[7] compared the number of proximal cavities found by means of a mirror and explorer examination with those found by means of bitewing roentgenograms. One hundred and fifty-seven children were examined clinically and roentgenographically and 1,117 proximal cavities were recorded. Of the total areas of proximal decay, 56.04 per cent were detected by clinical examination, 93.11 per cent were located by roentgenographic examination, and 49.15 per cent were discovered by both methods. Forty-seven and two tenths per cent of the cavities detected by roentgenograms were not found in the clinical examination.

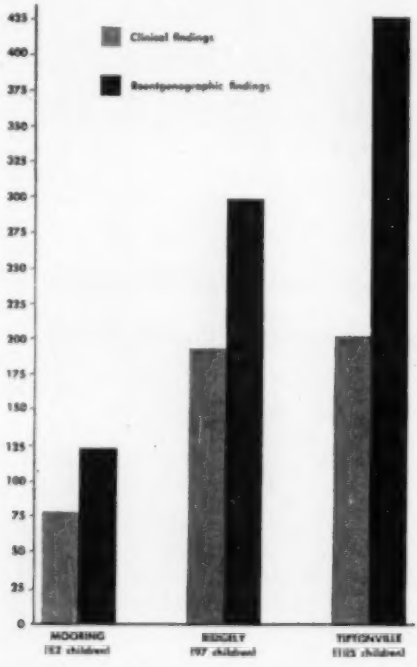


Fig. 1.—Comparison of the number of proximal cavities found on all posterior teeth (deciduous and permanent) by clinical examination with those found by roentgenographic examination (bitewing films).

2. McCall, J. O., and Wald, S. S., Clinical Dental Roentgenology, ed. 2, Philadelphia, W. B. Saunders Co., 1947, p. 1.

3. Fixott, H. C., Use of Roentgen Rays in the Practice of Children's Dentistry. *J.A.D.A.* 24:91 (Jan.) 1937.

4. Delabarre, E. A., Preschool Age Dentistry. J.A.D.A., 20:124 (Jan.). 1933

5. White, D. P., Preliminary Bite-wing Roentgenographic Examination of Naval Aviation Cadets. *Naval Med. Bul.* 43:901 (Nov.) 1944.

6. Smith, R. K., The X-ray—An Essential to Diagnosis and Prognosis of the Child Patient. *J.A.D.A.*, 29:796 (May) 1942.

7. Barr, J. H., The Diagnostic Value of Radiographic Examination for Proximal Caries in Deciduous Posterior Teeth. *New Zealand D. J.*, 41:89 (July) 1945.

Background of Study

For a number of years public health dentists and local practicing dentists have suspected a difference in the caries attack rates of rural and urban children of Lake County, Tennessee. As the difference became more apparent, there was considerable speculation among interested individuals regarding the possible cause of this observation. Since there was a limited amount of accurate data available to substantiate these casual observations, the Dental Hygiene Service of the Tennessee Department of Public Health undertook a survey to determine if an actual difference existed in the caries attack rates of rural and urban children of this area, and if the difference in rates was significant.

Figures 1 and 2 indicate that an actual difference did exist in the caries attack rates of these three groups of children as was suspected. The difference in rates was found to be statistically significant. It should be pointed out that the enrollment of Mooring School is entirely rural, while that of Ridgley is rural and urban, and Tiptonville is predominantly urban. Further epidemiological investigation will be done with these data in the near future.

During the survey, the investigators used bitewing roentgenograms to supplement the clinical examinations, and in the process of tabulating the findings decided to make a separate study of these two methods of diagnosis of caries.

Methods

In the present study, it was decided to compare the number of proximal cavities found by clinical examination with the number of proximal cavities found by bitewing roentgenograms. Carious lesions in lingual, buccal and occlusal pits and fissures were not included, because incipient decay in those areas, while readily detected in a clinical examination, may not appear on the bitewing roentgenogram.

Utilizing a mobile unit, a dentist and a dental hygienist from the Tennessee Department of Public Health visited seven schools in Lake County, Tennessee. The dentist made thorough dental examina-

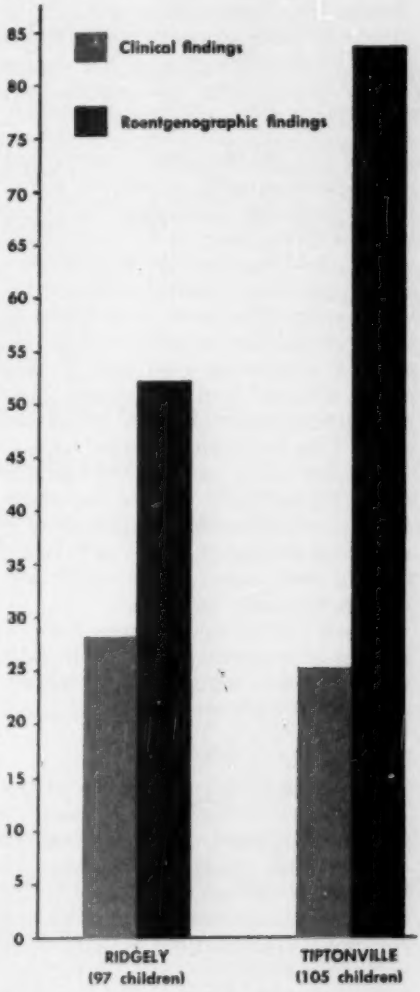


Fig. 2.—Comparison of the number of proximal cavities found on permanent first molars by clinical examination with those found by roentgenographic examination (bitewing films)

Table I.—Additional cavities found by the roentgenographic examination of all posterior teeth and permanent first molars for the children of Mooring, Ridgely, and Tiptonville schools

School	Number of children	Additional cavities in all posterior teeth		Additional cavities in permanent first molars	
		Number	Percentage	Number	Percentage
Mooring	52	45	57.6		
Ridgely	97	104	54.5	24	85.7
Tiptonville	105	222	111.0	59	236.0

tions of 449 children using a mirror and sharp explorer under a portable Pelton light. Bitewing roentgenograms were taken of the children in the three larger schools. Two hundred and fifty-four sets of bitewing films remained after discarding those in which there were defects or overlapping. After independent diagnosis, using a magnifying glass and a view screen, the two of us arrived at a common interpretation of the roentgenograms. Only cavities on proximal surfaces were counted. Such cavities were defined roentgenographically as any departures from the normal tooth structure, either in enamel or in enamel and dentin, which make a tooth appear more radiolucent than in the unaffected areas.

In part I of this study all proximal cavities on all posterior teeth (teeth distal to the cuspids), both deciduous and permanent, were recorded.

Results

In Mooring, a rural grade school where 52 children were examined, 78 cavities were found with the mirror and explorer while 123 were observed in the bitewing roentgenograms. Thus when bitewing examinations were made, 57.6 per cent or 45 additional areas of decay were discovered.

Ninety-seven children were examined in Ridgely, a consolidated grade and high school. In the clinical examination 191 carious areas were found, whereas the roentgenographic examination revealed 295 cavities. Here the use of bitewing films located an additional 104 cavities or an increase of 54.5 per cent.

The third school, Tiptonville, also was a consolidated grade and high school, and its pupils had significantly higher DMF and def rates than the children of the other two schools. An examination of 105 students disclosed 200 carious areas clinically and 422 roentgenographically, revealing an additional 222 cavities or an increase of 111 per cent when the roentgenogram was included in the diagnosis.

For the second part of this study clinical and roentgenographic findings of proximal cavities in only the permanent first molars were used since that tooth was common to all age groups examined.

In the Mooring school the number of proximal cavities found on permanent first molars was too small to be significant.

The clinical examination of the 97 children of Ridgley disclosed 28 cavities while the bitewing examination revealed an additional 24 carious areas, an increase of 85.7 per cent.

Only 25 cavities were found in the clinical examination of 105 Tiptonville students in contrast with the 84 cavities found with the aid of the bitewing roentgenograms. In this school 59 (236 per cent) more cavities were found by means of the roentgenographic examination.

Summary

The value of the bitewing roentgenogram in locating proximal cavities is shown graphically in Figures 1 and 2 and Table 1. Two hundred and fifty-four children in three schools in Lake County, Tennessee, were given thorough dental examinations with a mirror and an explorer and bitewing roentgenograms were taken of the same children. When the proximal cavities in all posterior teeth were recorded for both examinations, the roentgenographic examination proved indispensable, revealing 54.5 per cent, 57.6 per cent, and 111 per cent more cavities in the three schools.

Bitewing films again were invaluable in detecting proximal cavities on permanent first molars alone. The roentgenographic diagnosis revealed 85.7 per cent and 236 per cent more cavities than the mirror and explorer examination in the Ridgely and Tiptonville schools respectively.

The findings of this study demonstrate how incomplete a dental examination is if bitewing examinations are not included. The roentgenograms should by no means replace the mirror and explorer examinations, but rather should be employed as an adjuvant. Only through this combination of examining methods can the dentist provide early detection of cavities for his patient.—*West Tennessee Regional Office, Health Department Building.*

EVANSTON DENTAL CARIES STUDY IV. PRELIMINARY REPORT OF LACTOBACILLUS COUNTS IN EVANSTON AND OAK PARK CHILDREN

E. Esch Davies, D.D.S., Chicago

IN RECENT YEARS a great deal of interest has been aroused in the role of the lactobacilli in dental caries. As far back as 1899, Goadby[1] found an organism, which he called *Bacillus necrodentalis,* in sections of carious teeth. Kligler[2] demonstrated in 1915 that his acidogenic organisms and Goadby's *B. necrodentalis* were identical with Moro's *Lactobacillus acidophilus.* Howe and Hatch[3] confirmed the findings of Kligler, Goadby, and the Moro-Tissier group, and listed *L. acidophilus, Bacillus bifidus,* and *Bacillus M, X* and *Y* as associated with caries. The last three were later considered forms of *L. acidophilus.*

In more recent years a close correlation between *L. acidophilus* and the incidence of dental caries has been reported by a number of investigators (Bunting and Palmerlee 1925;[4] Jay and Voorhees

Presented before the Section on Research, eighty-ninth session of the American Dental Association, Chicago, September 15, 1948.

1. Goadby, K. W., Micro-organisms in Dental Caries. *Odont. Soc. Trans.* 31:925, 1898-1899.

2. Kligler, I. J., A Biochemical Study and Differentiation of Oral Bacteria With Special Reference to Dental Caries. *J. Allied D. Soc.* 10:141, 282, 445, 1915.

3. Howe, P. R., and Hatch, R. E., A Study of the Micro-organisms of Dental Caries. *D. Cos.* 59:961 (Oct.) 1917.

4. Bunting, R. W., and Palmerlee, F., The Role of B. acidophilus in Dental Caries. *J.A.D.A.* 12:381 (April) 1925.

1927;[5] Enright, Friesell and Trescher 1932;[6] Arnold and McClure 1941;[7] Kesel 1943;[8] and Jensen and Millarr 1944[9]).

In a series of publications since 1939, this relationship was also observed on a population basis in fluoride and nonfluoride areas (Dean, Jay, Arnold, McClure and Elvove 1939;[10] Dean, Jay, Arnold and Elvove 1941; 1942,[11] and the authors reported a correlation between the distribution of oral *L. acidophilus* counts and the dental caries attack rates in these areas.

Purpose of Study

Because of these previous investigations, saliva specimens are being taken on a random sampling of all the children examined in the Evanston Dental Caries Study. These specimens are being used to study the effect of the addition of one part per million of the fluoride ion to the drinking water, not only on the caries rate of the teeth, but also on the bacterial count of the saliva.

This report presents only the preliminary findings of a long term project. It is based on examination of saliva specimens taken from children 6 to 8 years of age in Evanston in 1946, before fluoride was added; in Oak Park as the control community in 1947; and in Evanston in 1948 after one year of treatment of the water with fluoride. The children 12 to 14 years of age are not included in this report, since the data on the second examination in Evanston is not complete at this time.

The preliminary findings in this report include the study of the following:

1. The percentage of children in each of the lactobacillus count and type groups.

2. The average number of untreated carious surfaces and the average total DMF surfaces per child in each of the lactobacillus count and type groups.

3. The relation of the rate of flow of saliva to the lactobacillus count and type groups.

4. The relation of (A) the percentage of children, and (B) of the average number of untreated carious surfaces and the average total DMF surfaces, to lactobacillus count in a community before and after sodium fluoride was added to the water.

5. The difference between the bacterial counts of saliva specimens plated immediately and those not plated immediately but subjected to controlled temperature conditions.

Methods

Saliva specimens were obtained from approximately one tenth of all the children examined. These children were taken at random without differentiation as to sex, age, color or oral conditions. Because of this random sampling, the data presented are based on an age group as a whole, rather than on an individual age and sex basis.

The specimens were collected approximately two hours after a meal, and before either the dental or roentgenographic examinations were made. The saliva was stimulated by having the child chew a

5. Jay, P., and Voorhees, Jr., R. S., Bacillus Acidophilus and Dental Caries. *D. Cos.* 69:977 (Oct.) 1927.

6. Enright, J. J.; Friesell, H. E., and Trescher, M. O., Studies of Cause and Nature of Dental Caries." *J. D. Res.* 12:759 (Oct.) 1932.

7. Arnold, Jr., F. A., and McClure, F. J., A Study of the Relationship of Oral L. acidophilus and Saliva Chemistry to Dental Caries. *Pub. Health Rep.* 56:1495 (July) 1941.

8. Kesel, R. G., Dental Caries: Etiology, Control and Activity Tests. *J.A.D.A.* 30:25 (Jan.) 1943.

9. Jensen, A. L.; Becks, H., and Millarr, C. B., Rampant Dental Caries: Prevention and Prognosis. *J.A.D.A.* 31:1189 (Sept.) 1944.

10. Dean, H. T.; Jay, P.; Arnold, Jr., F. A.; McClure, F. J., and Elvove, E., Domestic Water and Dental Caries Including Certain Epidemiological Aspects of Oral L. acidophilus. *Pub. Health Rep.* 54:862 (May 26) 1939.

11. Dean, H. T.; Jay, P.; Arnold, Jr., F. A., and Elvove, E., Domestic Water and Dental Caries. I. Dental Caries Study, Including L. Acidophilus Estimations, of Population Severely Affected by Mottled Enamel and which for the Past Twelve Years Has Used Fluoride-Free Water. *Pub. Health Rep.* 56:565 (Feb. 28) 1941. Domestic Water and Dental Caries. II. A study of 2,832 White Children Aged 12-14 Years of Eight Suburban Chicago Communities, Including L. acidophilus Studies of 1,761 Children. *Public Health Rep.* 56:761 (April 11) 1941.

paraffin pellet, and was then collected in a wide mouthed, sterile, cork stoppered specimen bottle. The exact time for the collection of a 5 to 6 ml. specimen was recorded, and later at the laboratory the exact amount was measured by pipette and recorded. The specimens were then taken back to the Evanston Public Health Laboratory in a large ice-cooled vacuum jug, where a 1:10 dilution and 1:100 dilution with sterile, normal saline were made of each saliva specimen. Two plates were then inoculated with a 1:10 dilution, and two plates with a 1:100 dilution. The inoculation was done by placing 0.1 ml. of the diluted specimen along with 0.4 ml. of sterile, normal saline on each plate. The inoculum was spread by gently tipping the plate back and forth in such a manner as to cause the liquid to flow evenly over the entire surface of the media. This method was used in place of spreading with a glass rod in order to decrease the chances of contamination and loss of bacteria in the inoculum. The plates were then incubated at 37°C. for approximately 60 hours before counting.

The medium used was a tomato juice, yeast extract agar,[12] which was made as follows: 5 Gm. "Bacto-Difco" peptone, 10 Gm. "Difco" peptonized milk and 5 Gm. "Difco" yeast extract were added to 400 ml. filtered juice of whole, canned tomatoes[13] along with enough distilled water to make one liter of the medium.

The medium was then adjusted to a pH of 5.0 to 5.2 and the entire amount autoclaved for 20 minutes at 15 pounds pressure. The plates were poured and then incubated for 24 hours to detect contamination. The plates were then placed in the refrigerator until used, though never for more than four days after pouring.

When the bacterial colonies were counted, stained cellular preparations were made of each type of colony, so that both macroscopic and microscopic classifications could be made. A differential count was made of each plate, and the average counts were taken of the two plates made with the 1:100 and the two plates made with the 1:10 dilution.[14] The average count of the two plates made with the 1:10 dilution was considered wherever possible as the bacterial count for that specimen. In only a few cases was it necessaray to use the 1:100 averages.

The classification of the types of lactobacilli was based on the classification of Hadley and Bunting.[15] In this classification, the micro-organisms are divided into four different morphologic types and are referred to by number. The Type I colony is smooth, round, convex, opaque and small, whereas the cells are short, almost coccoid and are seen as curved rods with concave surfaces of two rods often opposing one another. The Type II colony is smooth, round, opaque, convex and larger, with cells that are straight and longer than Type I, and shows a definite parallel arrangement. A Type III colony is intermediate to Types II and IV. It is slightly irregular, flat and translucent. The cells are thick, blunt bacilli, varying from short to long forms with no definite chain formation, palisading or concave forms. In Type IV the colony is rough, larger than the other three, and transparent. The cells are thick, often long, winding filaments which appear curled and wavy.

The colonies were studied morphologically under a low-power binocular microscope, and then gram-stained cellular preparations of the bacilli were studied

12. Used by the Zoller Dental Clinic Bacteriology Laboratory, at the University of Chicago. See: *J Dent. Res.*, 25:455 (Dec.) 1946.

13. "Yacht Club" whole tomatoes, canned by Reid, Murdoch & Co., Chicago, Illinois.

14. To determine the number of lactobacilli per ml. of saliva the number of colonies on the plate was multiplied by 100 in the case of 1:10 dilution, and 1000 in the case of the 1:100 dilution. The multiplication by an additional 10 was necessary because only 0.1 ml. of inoculum was used on each plate.

15. Hadley, F. P., and Bunting, R. W., Further Studies on the Recognition of B. acidophilus. J.A.D.A. 19:98 (Jan.) 1932.

Table 1.—Distribution of children among lactobacillus count and type groups for each community

A.—Percentage of children in each count group

	Negative	1-10^2	10^2-10^3	10^3-10^4	10^4-10^5	10^5—	Extremes
Evanston 1946	25.5	8.5	7.8	23.6	28.7	4.6	1.3
Oak Park 1947	28.4	—	3.7	29.6	27.2	9.3	1.8
Evanston 1948	34.0	3.7	9.0	16.5	24.1	11.2	1.5

B.—Percentage of children in each type group

	Negative	Type I	Type II	Type III	Type IV	Mixed type*
Evanston 1946	25.5	13.3	15.4	4.6	4.6	36.6
Oak Park 1947	28.4	4.9	40.7	6.3	—	19.7
Evanston 1948	34.0	7.7	33.9	4.7	2.4	17.3

C.—Percentage of children in each mixed-type combination

	Percent of all cases	I, II & III or IV	I & III or IV	II & III or IV	I & II	III & IV	Other combinations
Evanston 1946	36.6	7.9	7.2	7.2	11.1	1.3	1.9
Oak Park 1947	19.7	—	—	14.8	4.9	—	—
Evanston 1948	17.3	—	2.3	9.0	3.7	1.5	0.8

*Saliva specimens contained more than one type of lactobacillus.

under oil immersion to determine the type. Whenever possible the colonies were counted with a simple hand punch counter but, when the number of colonies was too great for this method, a standard type of illuminated colony counter was used for an approximation of the count.

Results

Up to the present time 7,713 children have been examined in Evanston and Oak Park and from these 785, or 10.2 per cent, contributed saliva specimens. Only 367, or 46.8 per cent, of these children were from 6 to 8 years of age and therefore considered in this report. One hundred fifty three of them were in the Evanston 1946 group, 81 in the Oak Park group and 133 in the Evanston 1948 group.

The Evanston 1946 figures are on the base line study, and there had been no fluoride added to the drinking water at that time. The Oak Park 1947 figures are for the control community without fluoride in the drinking water. The Evanston 1948 figures were taken after one part per million of sodium fluoride had been added to the drinking water for one year.

1. The percentage of children in relation to the total lactobacillus count and the morphologic type.—Table 1 shows the percentage of negative and positive salivas, the latter computed for each count group and for each type.[16]

16. In each community there were approximately 1.5 per cent of the cases with results so contrary to the norm that they were removed from the data, and will not appear in any of the following tables. The exact percentage is shown in the extreme right-hand column of Table 1.

Table 2.—Average number of untreated carious and average total DMF surfaces per child in each lactobacillus count and type group for each community

By lactobacillus count

	Negative	1-10^2	10^2-10^3	10^3-10^4	10^4-10^5	10^5-—
Evanston 1946						
Av. Carious	4.0	5.3	6.7	11.0	14.7	10.7
Av. DMF.	8.9	7.8	15.0	18.6	23.2	17.2
Oak Park 1947						
Av. Carious	2.9	—	3.7	6.3	14.5	9.9
Av. DMF.	7.6	—	3.7	12.9	22.4	15.4
Evanston 1948						
Av. Carious	3.4	8.7	6.7	8.4	10.2	10.3
Av. DMF.	4.0	16.3	14.4	14.2	18.8	18.8

By lactobacillus type

	Type I	Type II	Type III	Type IV	Mixed-type
Evanston 1946					
Av. Carious	9.8	8.7	15.0	13.3	11.9
Oak Park 1947					
Av. Carious	6.0	9.5	7.0	—	11.3
Evanston 1948					
Av. Carious	7.5	9.6	4.0	18.7	12.4

It will be noted from the first part of Table 1 that the greatest percentage of the children appears to be in the group showing no lactobacilli and in the groups with from 1,000 to 10,000 and 10,000 to 100,000 lactobacilli per milliliter of saliva. There seems to be a relatively small percentage of the cases in the count groups ranging from 1 to 100, 100 to 1,000 and 100,000 and over.

From the B section of Table I it will be seen that the greatest percentage of cases seems to be of Type II or of the mixed-type and that only very small percentages appear to be of Types III and IV. The distribution of the mixed-type is shown in the C section of Table 1 and from it may be noted that Type II also appears in combination with other types more frequently than any of the others.

2. The average number of untreated carious surfaces and the average total DMF surfaces per child in each lactobacillus count and type group.—Table 2 shows the average number of carious and DMF[17] surfaces as distributed among the different count groupings, and also among the morphologic types of lactobacilli. It will be noted from Table 2 that there is a definite relation between the average number of carious surfaces per child and the lactobacillus count groups. The children whose saliva show a negative lactobacillus count have, on the average, fewer carious surfaces than

17. DMF surfaces in this report refer to decayed (carious), missing and filled surfaces as compared to the carious surfaces only, and are all average per child. Therefore the average number of DMF surfaces should be almost twice that of the average number of carious surfaces.

Table 3.—Rate of flow of saliva by lactobacillus count and type group in milliliters per minute

By lactobacillus count						
	Negative	1-10^2	10^2-10^3	10^3-10^4	10^4-10^5	10^5—
Ml. per minute	0.68	0.55	0.60	0.68	0.74	0.85
Percent of children	35.6%	2.2%	9.0%	16.4%	24.1%	12.7%

By lactobacillus type						
	Negative	Type I	Type II	Type III	Type IV	Mixed-Type
Ml. per minute	0.68	0.77	0.76	0.77	1.3	0.73
Percent of children	35.6%	7.6%	33.5%	5.7%	0.82%	16.7%

the children whose count was from 1,000 to 10,000 per milliliter; those with 1,000 to 10,000 counts have fewer surfaces than do those with counts from 10,000 to 100,000. It may be noted, however, that there is some variation in the lower count groups, such as in the 1 to 100, and 100 to 1,000 groups, and at the higher extreme of the 100,000 and over group. This difference probably is due to the smaller percentage of cases in these groups than in the other groups. The same trend seems to hold true for the total DMF surfaces.

The lower half of Table 2 shows the relationship of untreated carious surfaces to the different types of lactobacilli. It may be noted from this chart that there seems to be very little relationship, if any, between the type of lactobacillus present and the average untreated carious surfaces found.

3. The relation of the rate of flow of saliva to the lactobacillus count and type groups.—Table 3 shows the relation of the flow of saliva in milliliters per minute to the lactobacillus count groups and types, along with the percentage of children in each classification. It will be noted that the figures for rate of flow of saliva increase slightly from the 1 to 100 group through to the 100,000 and over group, and that the rate of the negative group is the same as that of the 1,000 to 10,000 group. It will also be noted that the rate of flow is almost the same for all except Type IV. This may be due to the fact that only 0.82 per cent of the children fall in the Type IV classification.

4. The lactobacillus count of the saliva as related to (A) the percentage of children and (B) the average number of untreated carious and total DMF surfaces before and after fluoride was added to the water.—In Table 4 (A), it may be noted that from Evanston 1946 to Evanston 1948 there is a slight increase in the percentage of cases in the groups under 1,000 lactobacilli per milliliter and a slight decrease in percentage in the groups over 1,000. This shift from the higher to the lower count groups occurred in only about 5.0 per cent of the cases in Evanston from 1946 to 1948.

It also may be noted (Table 4,B) that from Evanston in 1946 to Evanston in 1948, there is an average decrease of 4.7 in the average number of carious surfaces per child. There is also a decrease of 4.2 in the average number of DMF surfaces per child in Evanston between 1946 and 1948.

5. The effect, on the bacterial count of the saliva, of immediate and delayed plating of saliva specimens.—The graph in Figure 1 shows the bacterial count per milliliter after permitting saliva to stand at room temperature (25-35° C.) or at refrigerator temperature (5-10° C.) for 24 to 96 hours before plating, as compared to bacterial counts of saliva specimens plated within one to four hours after they were taken. It will be noted that there is a definite decrease in the average count per milliliter of saliva after it has stood under either condition for 24 hours. After 48 hours the average count for both is nearly the same as that of those plated immediately. At 72 hours there is another decrease for the specimens at room temperature, but not so great a decrease for those at refrigerator temperatures. The two conditions seem to have about the same effect on the count after 96 hours. This data should be qualified by stating that 100 specimens were carried for the first 24 hours; 50 for 48 hours; 30 for 72 hours; and only 16 were carried for 96 hours after the routine, immediate plating had been done.

Summary and Conclusions

It appears, from the percentage of children in the different count groups of lactobacilli, that the majority of saliva specimens are either negative or have lactobacillus counts of from 1,000 to 100,000 per milliliter. Only rarely is the count between 1 and 1,000 or over 100,000. It also appears, from the percentage of cases in the different type groups, that the most prevalent in the saliva specimens studied are Type II and a mixture of types. The type of lactobacillus most commonly found in combination with others is Type II. It may therefore be assumed that Type II is the most prevalent in the specimens studied.

There appears to be a definite relationship between the average number of untreated surfaces per child and the lactobacillus count groups. This would seem to be true from the fact that there is a marked increase in the average number of carious surfaces as the count increases, and also that the deviations from this relationship are directly related to the percentage of children in each group.

Table 4.—Comparison of Evanston results, 1946 with 1948

A.—Percentage of total children in each lactobacillus count group

Community	Negative	1-10^2	10^2-10^3	10^3-10^4	10^4-10^5	10^5.—
Evanston 1946	25.5%	8.5%	7.8%	23.6%	28.7%	4.6%
Evanston 1948	34.0%	3.7%	9.0%	16.5%	24.1%	11.2%
Evanston 1948	Increase of 4.9%			Decrease of 5.1%		

B.—Average number of carious and DMF surfaces per child in each lactobacillus count group

Evanston 1946						
Av. Carious	4.0	5.3	6.7	11.0	14.7	10.7
Av. DMF.	8.9	7.8	15.0	18.6	23.2	17.2
Evanston 1948						
Av. Carious	3.4	8.7	6.7	8.4	10.2	10.3
Av. DMF.	4.0	16.3	14.4	14.2	18.8	18.8

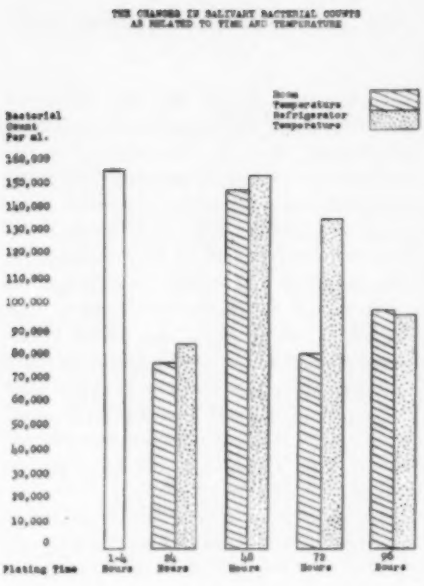


Figure 1

This would also seem to hold true to some extent for the total DMF surfaces.

There would seem to be very little relation, if any, between the type of lactobacillus present in the saliva and the average number of carious surfaces found in each child. Although it has not been observed by these methods of comparison and classification, it should not be concluded that such a relationship may not exist.

Seemingly, there is some connection between the rate of flow of saliva and the count groups of lactobacilli present per milliliter of saliva. There also seems to be some relation between the rate of flow and the type of lactobacillus present in the saliva. However this preliminary data is based only on the Evanston study in 1948, after there had been sodium fluoride in the water for one year, and shows only that there may be some relationship.

It would seem from the data that there has been a shift of about 5.0 per cent of the cases from the higher count groups (those over 1,000 lactobacilli per ml. of saliva) to the lower count groups, (those under 1,000 per ml.) in Evanston in 1948. This would seem to indicate that there was a decrease in the lactobacillus counts of the children from 6 to 8 years of age, after one year of fluoride in the water. There also seems to be a decrease of 4.7 in the average number of carious surfaces, and 4.2 in the average DMF surfaces per child. These decreases, however, are not sufficiently large to be considered as an indication of trends. They may fall within the range of statistical error, due to accident or chance sampling. It should also be remembered that these are only preliminary findings, and by no means indicate that fluoride in the community water will definitely have this effect.

The data would also seem to indicate that there is some change in the bacterial count if the saliva is allowed to stand for a considerable length of time before plating. This variation in the count might be considered when evaluating the accuracy of bacterial counts of saliva specimens when for any reason the plating has been delayed.

The results of this preliminary investigation would seem to indicate that morphologic Type II Lactobacillus was the most prevalent in the 367 saliva specimens studied. They would also seem to indicate that there was a definite relationship between lactobacillus counts and the average number of untreated carious and total DMF surfaces. However it would seem that there was little if any relationship between the type (or types) of lactobacillus and the average number of untreated carious surfaces per child. There also seems to be some indication that there is a relation between the rate of flow of saliva and lactobacilli.

The results of this preliminary study also seem to indicate that after one year

with fluoride in the water, there was some decrease in the lactobacillus count, the average number of untreated carious surfaces and the average number of DMF surfaces. This, however, should not be considered a finding of significance since it is based on preliminary findings of a long term project and the decrease is so small that it might be due to chance or accident. Finally, the findings would also seem to indicate that there is some variation in the bacterial count if the saliva specimens are allowed to stand for an appreciable length of time before plating.

RAPID DENTAL SURVEYS: A CASE FINDING PROCEDURE FOR CONGENITAL SYPHILIS

Frank P. Bertram, D.D.S., M.P.H., Oklahoma City

As the result of a routine dental inspection made on 200 Negro school children during Negro Health Week in 1948 a surprising proportion of children with Hutchinson teeth was observed. Upon questioning, none of the children so classified could recall having had any treatment. The existence of an unmet public health problem (that is, untreated congenital syphilis) appeared quite possible and worthy of further investigation.

It is somewhat difficult to arrive at definite conclusions as to the incidence of congenital syphilis. Jeans[1] once estimated that the incidence of congenital syphilis is approximately one case for every four adult males with the disease. Among 100,000 new admissions to the Harriet Lane Home Dispensary, approximately 2 per cent of the Negro children and 0.5 per cent of the white children were found to have congenital syphilis. This is in general agreement with the observations of Clifton and Heinz[2] who did serology tests of 185 hospitalized Negro children, aged 1 to 13 years, and found 2.7 per cent were syphilitic. Cole[3] cites rates of 19 to 31 per cent prenatal syphilis among Negro populations. Brumfield, Lade and Feldman[4] found 7 per cent with congenital syphilis among 80,000 cases of syphilis from all age groups reported in New York state during five years.

According to Jeans[5] the dental deformities constitute the most important of the stigmas of congenital syphilis because of their relative frequency. In a study of 463 syphilitic children more than 6 years old, dental hypoplasias were

Presented before the Dental Health Section, American Public Health Association, Boston, November 10, 1948.

Director, Division of Preventive Dentistry, Oklahoma State Health Department, Oklahoma City.

The author wishes to express appreciation to the Health Education Department of the Oklahoma City schools and to his co-workers in the Oklahoma State Health Department, both in the central office and local departments, for their assistance and cooperation in this study.

1. Jeans, P. C., and Cooke, J. V., *Prepubescent Syphilis (Clinical Pediatrics, vol. 17)*. New York: Appleton-Century-Crofts Co., Inc., 1930, pp. 86-90.

2. Clifton, W. M., and Heinz, Mary O., A Survey of Prenatal Syphilis in a Hospital for Sick Children. *J.A.M.A.* 114:1731 (May) 1940.

3. Cole H. N., Congenital and Prenatal Syphilis. *J.A.M.A.* 109:580 (Aug.) 1937.

4. Brumfield, W. A., Jr.; Lade, J. H., and Feldman, L. L., The Epidemiology of Syphilis Based Upon 5 Years' Experience in an Intensive Program in New York State. *Am. J. Pub. Health* 32:793 (Aug.) 1942.

5. Jeans, P. C., and Cooke, J. V., *Prepubescent Syphilis (Clinical Pediatrics, vol. 17)*. New York: Appleton-Century-Crofts Co., Inc., 1930, p. 225.

noted in 185 or 40 per cent. In discussing the dental development of patients with congenital syphilis, Bauer[6] states that it is the syphilitic inflammation of the dental sac which destroys or damages the ameloblasts, thus producing enamel hypoplasia. The gross abnormalities are readily apparent but dentists, because of their training and continuous clinical experiences, are most highly conscious of slight dental variations. This is important in the detection of atypical manifestations and in the differentiation of Hutchinson teeth from other dental hypoplasias. Brauer and Blackstone[7] reported a higher percentage of dental dystrophies associated with congenital syphilis than other observers. It seems particularly important for dentists in the public health field to be alert to this contribution they can make in the field of venereal disease control.

Study

In the study under consideration, the dental inspections were made using tongue blades and a pen-type flashlight. The inspections were really nothing more than a screening process and were done at the rate of 100 or more per hour. Attention was concentrated on the permanent incisors and first molar teeth since anomalies of the type sought may be most easily detected in these teeth. The majority of the children examined were of elementary school age since it was felt the possibilities for primary infections among this group would be sufficiently remote as to have no material effect on the data. The study was done in two parts with slight differences in method. Negro school children were used in both instances.

The first phase was dental screening and blood testing of a group of Oklahoma City elementary school children. These two procedures were done independently with no comparison of data until both studies had been completed and the results tabulated. Dental inspections were made of 1,045 children, grades one to six inclusive. The average age of the children was 9.25 years. The blood testing was on a voluntary basis, and 628 or 60 per cent had blood tests. The serology work was done in the state health department laboratories; Mazzini tests were performed, with the Kolmer test being done on those children having a doubtful or positive Mazzini reaction. From the 628 children, 8 positive Kolmer reactions were obtained, giving an incidence of 1.3 per cent for the group. This is in agreement with the experiences in a much larger group in Chicago,[8] where, during the year 1939-1940, blood tests on 5,138 Negro school children revealed 64 positive reactions, a rate of 1.2 per cent. From the dental screening a diagnosis of Hutchinson teeth was made in 26 instances, a rate of 2.5 per cent. Of these 26 children, 16 were among those having blood tests. From the 16 tested, there were 4 positive Kolmer reactions, 25 per cent of the group. Granting the fallacy of drawing conclusions from 16 cases, there still is a significant difference between the rate of 25 per cent for the selected group and 1.3 per cent for the group as a whole. Stated differently, of the positive reactions obtained by testing 628 children, one-half could have been secured by testing 16 dentally screened children.

For the second phase of the study serology tests were taken only on the children having Hutchinson teeth. Both Mazzini and Kolmer tests, and in some instances the Kahn test, were run on these children. The work was done in seven school systems scattered through-

6. Bauer, W. H., Tooth Buds and Jaws in Patients With Congenital Syphilis; Correlation Between Distribution of Treponema Pallidum and Tissue Reaction. *Am. J. Path.* 20:997 (Mar.) 1944.

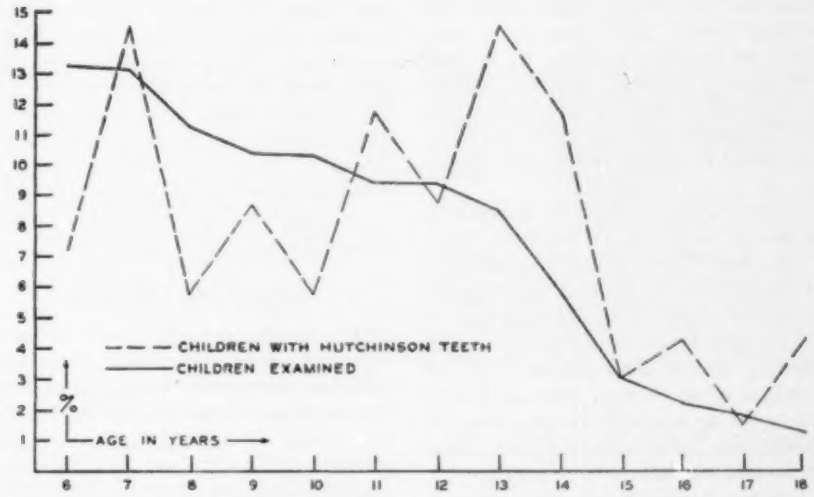
7. Brauer, J. C., and Blackstone, C. H., Dental Aspects of Congenital Syphilis. *J.A.D.A.* 28:1633 (Oct.) 1941.

8. Wenger, O. C., Annual Report, July 1, 1939 to June 30, 1940. Chicago Syphilis Control Program, Division of Venereal Diseases. U. S. Public Health Service (July) 1940, p. 81.

out the state of Oklahoma. In three of the seven schools, high school students were included to obtain sufficient numbers. The age range in these three instances was 6 to 18 years. In the other four schools, the first eight grades were used. The average age of the entire group was 10.2 years, nearly one year older than the Oklahoma City series comprising the first six grades. Dental inspections were made of 1,111 students. From the dental screening a diagnosis of Hutchinson teeth was made in 43 instances, or a rate of 3.8 per cent. Of these 43 children, 37 had blood tests. From the 37 tested, there were 9 positive reactions, approximately 25 per cent of the group.

From the 2,156 dental inspections, a diagnosis of Hutchinson teeth was made for 69 patients, a rate of 3.2 per cent; 53 of the 69 children had blood tests, there were 13 positive reactions, a rate of 24.5 per cent. This percentage has a standard error of slightly less than 6 per cent. The percentages of positive reactions in the two groups were strikingly similar: exactly 25 per cent in the Oklahoma City group and 24.3 per cent in the out state group.

The age distribution of children with Hutchinson teeth was plotted against the age distribution of the school populations examined. The range in both classes was 6 to 18 years, and 12 years was taken as the midpoint. The percentage with Hutchinson teeth in the upper range (13 to 18 years) was higher than the percentage distribution of these ages in four of the six points of computation. Conversely, in the lower age range (6 to 11 years) the percentage occurrence of Hutchinson teeth was lower than the percentage distribution of these ages in four of the six points of computation (see graph). Assuming that the children 12 years of age were born sometime during the year 1936, they and those born subsequently were the beneficiaries of the intensive program of venereal disease control which was started about that time. The lower incidence of Hutchinson teeth suggests a reduction in congenital syphilis, reflecting the effectiveness of the venereal disease control program.



Percentage distribution by ages of children examined and children with Hutchinson teeth

Another point of interest is the difference in Hutchinson teeth prevalence rates of the two series: 2.5 per cent in Oklahoma City against 3.87 per cent for out state. Part of this difference may be explained by the one year age difference of the two groups, the higher rate occurring in the older group which presumably had received less benefit from the venereal disease control program. Another influencing factor is the presence of the State University Hospital at Oklahoma City. For years, many Negro women have received prenatal and obstetric care at this institution with prenatal blood testing and treatment a routine practice. This forcibly illustrates the value of a good program of prenatal care.

Discussion

Speculation on the results of the study described develops some interesting questions. Wile and Mundt[9] report an incidence rate of 47 per cent Hutchinson teeth among 343 patients with congenital syphilis. In the series discussed here, 4 children, comprising 50 per cent of the positive reactions in the Oklahoma City group had no dental stigmas; but the question arises: were these cases congenital or acquired syphilis? In at least 2 of these 4 patients, acquired syphilis was considered possible and even probable, although epidemiologic investigations failed to obtain any histories indicative of acquired syphilis.

Positive serology reactions resulted in one fourth of the suspected cases. What of the other three-fourths? Was the dental diagnosis in error? This could be the reason for some of the discrepancy. It was thought better to err on the side of liberality rather than strictness in the appraisal of the dental stigmas. Therefore, mild or atypical manifestations of Hutchinson teeth were included, so as not to miss possible cases of syphilis.

Another possibility is that some of the children in the 75 per cent group had treatment, thus accounting for the negative reaction. Questioning of the children on this point at the start of the project was of little help and was discontinued. Considering how commonplace penicillin therapy has become, inadvertent antisyphilitic treatment is a possibility.

Acquired immunity with spontaneous remission is an accepted principle and may explain a portion of the negative reactions even when congenital stigmas existed. However, with definite congenital stigmas, a negative spinal fluid reaction and a thorough physical examination in addition to the negative blood reaction is necessary to eliminate the possibility of clinical syphilis in the opinion of various authorities who were consulted. This procedure was not included in the study presented, and bears further investigation.

Education and legislation on prenatal blood testing are powerful control factors. The campaign waged against venereal disease during the past decade or more is being felt now in a reduction of congenital syphilis. However, the fact remains that among the Negro population, where the rate of syphilis is high, prenatal control is poor. Many Negro women are not seen by midwife or physician until the time of delivery, rendering prenatal blood testing an impossibility. Laxity contributes further in the failure of prenatal blood testing. It is probable therefore that congenital syphilis as a problem of considerable proportions will remain with us for some time.

Summary and Conclusions

Hutchinson teeth, the most common stigma of congenital syphilis, occurs with sufficient frequency among groups of high syphilis incidence to be an effective

9. Wile, U. J., and Mundt, L. K., Congenital Syphilis: A Statistical Study With Special Regard to Sex Incidence. *Am. J. Syph., Gonor. & Ven. Dis.* 26:70 (Jan.) 1942.

case finding adjunct in a program of venereal disease control. Dentists are key individuals in this program because of their particular awareness of dental anomalies.

Dental inspections for the study discussed were done at the rate of 100 per hour. The rapidity and ease of this technic, by which large numbers were screened, are among its chief merits. Examination of 2,156 Negro school children resulted in 69 diagnoses of Hutchinson teeth. Of these 69, 53 had blood tests, of which 13 had positive reactions for syphilis, a percentage of 24.5.

The occurrence of Hutchinson teeth was proportionately higher in the older children (13 to 18 years) than in the younger children (6 to 11 years) of the series. This trend is interpreted as a quantitative reduction of congenital syphilis in recent years indicating increased effectiveness of venereal disease control. However, congenital syphilis will constitute a public health problem for some time, and it is imperative that dentists, particularly those in the field of public health, remain alert to the contribution they can make toward its control.

SYSTEMIC ASPECTS OF PRECOCIOUS ADVANCED ALVEOLAR BONE DESTRUCTION: PRELIMINARY REPORT

Ben Seidler,* A.B., D.D.S., Samuel Charles Miller, † D.D.S., and William Wolf,‡ M.D., M.S., Ph.D., New York

CHRONIC disease of one kind or another is the daily problem of the clinician whether he is engaged in general practice or in a specialty. An accurate diagnosis frequently requires careful study and evaluation of all systems and organs of the body, noting changes no matter how slight or seemingly unimportant. While it is common practice to examine the organs in the chest and abdominal cavities, the nose, throat, skin and osseous system, the mouth, teeth and alveolar structures are frequently neglected. Although it is recognized that systemic disorders are sometimes caused by oral disease, the converse, that dental and periodontal structures may be profoundly disturbed by systemic disease, is not often considered. While medical and dental cooperation has been rather close in regard to dental disease influencing body ailments, comparatively little effort has been spent to determine the influence of the somatic status upon causation of dental, or more specifically, periodontal disease—that is, disease of structures around the tooth, such as alveolar bone and gingival tissues.

The latter relation became conspicuous and puzzling when, in the course of examination of many clinic patients, ad-

*Formerly Research Associate in the Periodontia Department, New York University College of Dentistry.
†Professor of Periodontia, New York University College of Dentistry.
‡Consulting Endocrinologist, Periodontia Department, New York University College of Dentistry.

vanced periodontal disease was observed in young boys and girls in none of whom a purely local or mechanical cause such as occlusal trauma, food wedging between the teeth or poor oral hygiene, was sufficient to account for such advanced tissue damage. Obviously, some defect originating in regions other than the mouth must have been active to bring about this widespread destruction of soft tissue and bone.

In this presentation, a preliminary report is submitted of studies begun about ten years ago on 35 young patients. It was noted that the greater number of such patients afflicted with advanced alveolar bone destruction were females; the proportion being about 10:1, or 94.1 per cent for the females to 8.6 per cent for the males. This discovery was startling, the more so when it was compared with statistics comprising older patients with comparable periodontal disease.[1] In the older group, there is a slight predominance of males and in the younger group, females are more numerous. The sugges-

1. Miller, S. C., and Seidler, B. B., A Correlation Between Periodontal Disease and Caries. *J. D. Res.* 19: 549 (Dec.) 1940.

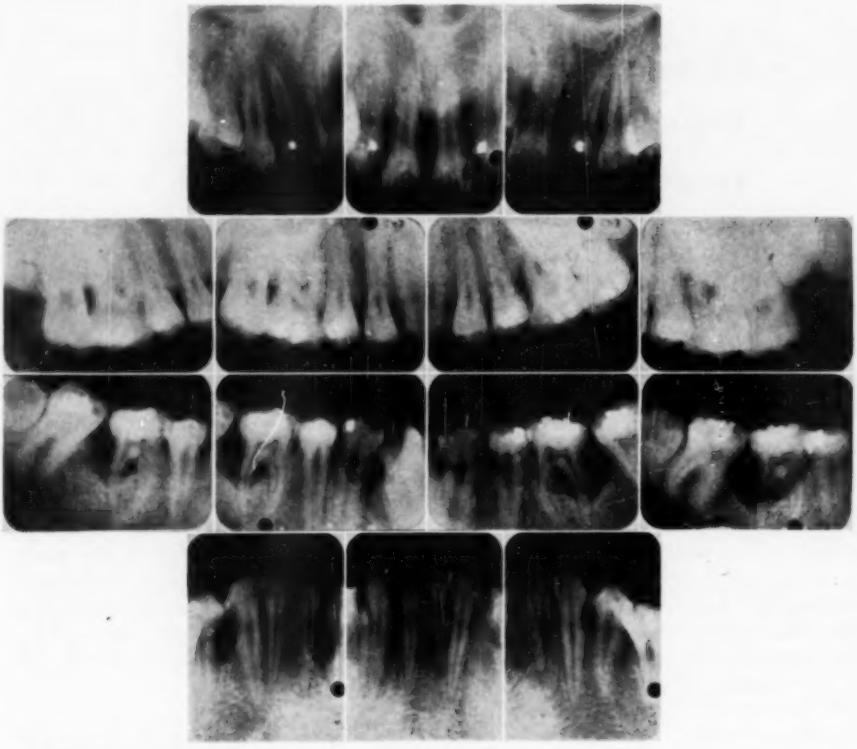


Fig. 1.—Characteristic picture of precocious advanced alveolar bone destruction (patient 19; see also Fig. 5). Note the extreme involvement of the incisor and first molar teeth and the slight amount of alveoloclasia in the other areas

tion became attractive that a possible relationship might exist between the disease and the periodic circulatory and other changes in the oral mucosa consistent with the cyclic changes that take place in the pelvic organs.

Evidence pointed to the probability that the periodontal disease seen in young individuals is a distinct entity different from that seen in older patients. In the latter group, advanced alveolar destruction is usually more diffuse and tends to affect the alveolar bone around all the teeth to an equal degree. On the other hand, in young individuals the disintegration is localized particularly in the incisor and first molar regions, in both the upper and lower jaws, while the alveolar bone around the other teeth is frequently spared from the destructive process (Figs. 1 and 2).

The patients studied ranged in age from 14 to 30 years;[2] the mean being 23.3 years. All patients were subjected to the following procedures at New York University College of Dentistry:

I. Histories: Medical, dental, dietary.

II. Physical Examination.

2. One patient, a twelve-year-old girl who appeared too late to be included in this study, had an alveolar destruction so great that the prognosis for most of her teeth was hopeless.

Fig. 2.—Patient 14 (see also Fig. 6). There is pronounced destruction of alveolar bone in the typical areas which, to a large extent, has spared the other regions

Table 1.—Results of laboratory tests for the group. Note that in only one case (No. 1, 8.3 mg.) was the calcium value below 9 mg. Eight cases had a reverse glucose tolerance curve

No.	Age	Sex	Hg.	RBC (millions)	WBC (thousands)	Height	Weight	B.M.R	S.D.A.	Cholesterol	Calcium	Diffusible calcium	Protein	Phosphorus	Phosphatase	Glucose Tolerance Test			
																Fasting sugar	1 Hr. sugar	2 Hr. sugar	3 Hr. sugar
1	15	F	82	4.00	9.4	60	95	− 8½	6½	175.5	10.7	5.1	7.0	2.9	2.0	98.0	108.2	115.0	101.3
2	20	F	67	3.70	5.6	59	108	+ 6	1	211.0	10.4	4.3	8.5	3.0	1.0	75.7	73.8	68.4	68.4
3	23	F	78	4.20	8.8	60½	128½	−14	10	175.3	11.7	5.5	6.2	2.1	2.5	81.3	84.9	83.3	76.7
4	23	F	75	4.50	8.9	62	118	− 1	5	175.5	11.7	4.8	8.4	2.5	2.7	81.4	98.0	80.0	88.1
5	25	F	86	4.40	7.2	60	104	+ 5½	6½	148.2	10.6	5.3	6.5	2.1	2.9	85.1	88.9	78.2	78.7
6	26	F	87	3.40	7.8	66	147	−16	2½	151.1	10.7	5.2	6.8	2.5	1.5	92.0	87.7	81.7	74.1
7	26	F	77	3.40	6.7	61	125½	− 2	8	162.3	10.7	5.1	7.0	2.4	1.6	92.1	88.9	92.3	92.5
8	21	F	84	4.30	11.0	64½	138	− 2½	1½	176.8	11.4	4.8	8.0	2.8	2.2	92.6	89.5	88.6	85.9
9	15	F	81	3.75	9.2	62½	120	− 7	6	177.3	11.3	4.9	7.3	2.6	2.9	83.0	80.7	79.9	79.1
10	25	M	97	5.50	9.2	72	203	−14	5	203.0	10.9	4.8	7.4	2.4	2.4	95.2	109.9	83.6	96.6
11	26	F	95	5.00	5.0	65	124	− 4½	4½	150.0	10.2	4.8	7.1	2.7	1.5	86.2	121.9	102.6	112.4
12	18	F	74	3.70	4.4	64	118	−23½	14	198.3	10.8	5.2	7.1	2.9	2.1	87.0	108.1	90.9	77.0
13	19	F	81	4.00	6.4	61	110	−15½	10	140.0	10.0	4.6	7.1	3.7	2.1	94.3	108.1	97.6	91.8
14	16	F	82	4.50	7.9	60	130	−21	6	278.4	10.2	4.3	8.0	3.2	2.0	80.0	104.7	90.9	90.5
15	30	F	77	3.80	8.9	60½	137	+ 1	5	225.2	11.2	4.3	9.1	2.2	2.5	93.0	114.9	114.9	108.0
16	26	M	93	5.00	8.1	67	151	− 8	14	208.3	10.4	4.5	7.5	3.3	2.0	84.4	84.4	80.2	79.6

17	22	F	82	4.00	6.2	69	132	−10½	8	256.0	9.5	4.0	8.3	4.2	1.5	87.0	100.0	113.0	85.1
18	26	F	85	4.70	7.8	66	138	− 2	6	238.0	11.8	4.5	7.9	2.4	1.8	94.3	111.1	111.1	106.0
19	24	F	89	4.60	9.3	58	98	− 6	4½	200.0	10.9	5.0	7.1	3.2	2.3	74.1	147.0	106.9	87.7
20	28	F	75	4.10	8.4	62¾	110	− 8	12	205.0	8.3	3.5	8.6	4.1	2.5	68.3	89.3	77.5	71.9
21	25	F	87	4.20	7.2	63	151	−12	1	170.0	9.5	4.2	6.9	3.8	2.0	55.0	60.4	50.0	56.0
22	30	F	71	3.40	6.9	64½	134	− 1	7½	175.0	10.0	3.8	9.1	3.7	2.1	66.6	71.9	66.2	54.0
23	20	F	82	4.20	8.2	62½	115	− 2	0	264.5	10.9	4.8	7.5	2.6	1.8	88.9	129.9	102.0	85.1
24	18	F	70	3.25	8.0	66½	115	−16	4	195.2	10.5	4.7	7.4	3.8	1.9	90.0	82.3	76.9	89.4
25	27	F	96	4.80	7.1	62½	140	− 7½	20	175.0	10.6	4.5	7.9	3.0	2.0	88.1	67.5	91.0	91.4
26	27	M	92	5.10	8.4	69	171	− 6	4	180.2	10.2	4.5	7.4	3.1	2.0	86.2	108.3	86.5	84.1
27	28	F	78	4.00	9.9	63	127	−21½	½	166.7	11.7	4.5	8.7	2.5	2.3	78.1	86.7	73.4	65.6
28	26	F	80	4.15	9.0	65½	130	− 7½	5	173.8	10.2	4.0	8.9	2.2	1.5	77.8	88.5	88.2	77.6
29	19	F	85	4.50	8.1	62	181	+ 2	4	238.0	11.2	4.8	7.8	2.2	1.5	92.6	103.8	96.4	90.0
30	25	F	84	4.30	9.2	63	125	− 5	6	303.0	10.8	5.0	6.9	3.6	3.7	86.2	124.0	90.9	89.3
31	30	F	91	4.20	7.3	57½	124	− 7	13	150.0	10.4	4.8	7.0	2.4	1.5	92.6	120.5	102.6	108.0
32	25	F	75	4.50	8.0	59¾	90	+ 6	6	208.3	11.5	4.8	8.0	3.5	2.6	102.6	121.2	103.6	106.3
33	14	F	83	4.20	9.8	60	94	− 4	5	165.7	11.0	4.8	7.6	3.1	2.2	84.1	98.5	87.2	87.1
34	23	F	79	4.00	8.5	64	110	+22	16	208.3	10.8	4.5	8.7	3.9	1.3	104.2	108.1	102.6	85.1
35	24	F	81	4.05	9.4	61	108	− 3	8	162.3	10.9	4.7	7.5	3.2	2.1	88.7	101.3	87.6	87.0
Mean	23.5		79.5	4.21	7.974	62.9	127.1	− 6.1	6.7	194.0	10.7	4.7	7.7	2.9	2.1	85.1	99.1	89.1	85.6

III. Oral Examination: Roentgenographic, clinical, casts of teeth.

IV. Laboratory Examination: Wassermann and Kahn, urinalysis, blood count and differential blood count, basal metabolism, specific dynamic action of proteins, blood cholesterol, serum calcium, diffusible calcium, serum inorganic phosphorus, phosphatase activity, plasma proteins, glucose tolerance test.

Questioning revealed that subjective discomfort and other signs in the mouth began most often close to the age of 13 or 14, or around puberty. In males, the onset seemed to be a trifle later. Eighty per cent of the patients consumed what appeared to be an excessive amount of carbohydrate. Other investigators[3] had previously found that restricting intake of carbohydrates, especially refined starches, was of considerable benefit in the treatment of advanced periodontal disease.

Laboratory studies as shown in Table 1 and Figures 3 and 4 revealed the following:

Wassermann and Kahn reactions were negative in all instances.

Urinalyses for albumin and glucose were negative in all but one. In that case (patient 1), there was a moderately positive albuminuria with occasional hyaline casts. All urine samples obtained during the glucose tolerance test were negative for sugar.

The blood counts and differential blood counts were all within normal limits.

In all but six patients, the basal metabolic rate was below zero per cent; the mean of the 35 cases being -6.1 per cent.

Specific dynamic action of protein rate, obtained by repeating the basal metabolism test one and one-half hours after a meal of the whites of three eggs, one slice of toast and a glass of water, was found to be definitely lower than the generally accepted average (mean, 6.7 per cent). The normal rise in rate after the test meal should be about 16 per cent. Only one in the group had a rate of more than 16 per cent.

Cholesterol values ranged near the upper limit of normality (average, 194.0 mg. per cent). This is probably related to the somewhat lowered basal metabolic rate.

Serum calcium values lay toward the upper limit of normality (mean, 10.7 mg. per cent). The values obtained were quite constant; 4 patients had a value below 10 mg. per cent and of these only one had a concentration below 9 mg. per cent.

Diffusible calcium (method of McLean and Hastings[4]) was well within normal limits (average, 4.7 mg. per cent).

The inorganic phosphorus level was found to be somewhat diminished (average, 2.9 mg. per cent). This finding might be anticipated from the somewhat augmented calcium level.

Phosphatase activity was found to be somewhat lowered (average, 2.1 Bodansky units). This corroborates a previous finding that systemic phosphatase decreases with the speed of alveolar destruction.[5]

Plasma protein values showed very few variations from the accepted normal (mean, 7.7 mg. per cent).

Glucose tolerance curves, obtained by administering 100 gm. of dextrose to all patients, were found to be consistently flattened with the exception of one case in which the curve was normal. The average values obtained (Fig. 4) were: fasting, 85.1 mg. per cent; one hour, 99.1 mg. per cent; two hours, 89.1 mg. per cent; three hours, 85.6 mg. per cent.

3. Weinmann, J., A Case of Healed Diffuse-Atrophic Bone Resorption Due to Change of Diet. Abstract. *J. D. Res.*, 11:507 (Dec.) 1932.

4. McLean, F. C., and Hastings, A. B., Clinical Estimation and Significance of Calcium-Ion Concentrations in the Blood. *Am.J.M.Sc.*, 189:601 (May) 1935.

5. Miller, S. C., and Pelzer, R. H., An Original Classification of Alveolar Types in Periodontal Disease and Its Prognostic Value: Corroboration by Plasma Phosphatase Determinations. *J.A.D.A.*, 26:565 (April) 1939.

Eight cases showed a "reverse" curve where the administration of dextrose resulted in a fall of blood sugar concentration.

Report of Cases

Two cases, selected because the oral manifestations were most typical and because of their extreme youth, are presented. The systemic findings in these two patients are considered most representative.

Case 1.—A white girl, 15 years of age (patient 19), who had been under the care of a competent dentist for a number of years, was referred to us for diagnosis and treatment of advanced alveolar bone destruction. She had no complaints other than those of the mouth. At present the diet seemed adequate. However, until the age of 14 she consumed an excessive amount of sweets. She gave evidence of emotional instability. Physical examination revealed the breasts to be slightly underdeveloped. The lower measurement (from the superior border of the symphysis pubis to the floor) was longer than that of the distance from the symphysis to the top of the head. The height was 62½ inches and the lower measurement was 32½ inches. The legs showed marked hirsutism and tended toward masculine configuration. A number of signs of constitutional inferiority were evident, such as Darwin's tubercle and nasal notches. A considerable amount of lymphoid tissue was visible at the base of the tongue. The pulse rate was slow (58 per minute). Laboratory examination revealed the following significant findings: specific dynamic action of proteins was 6 per cent;

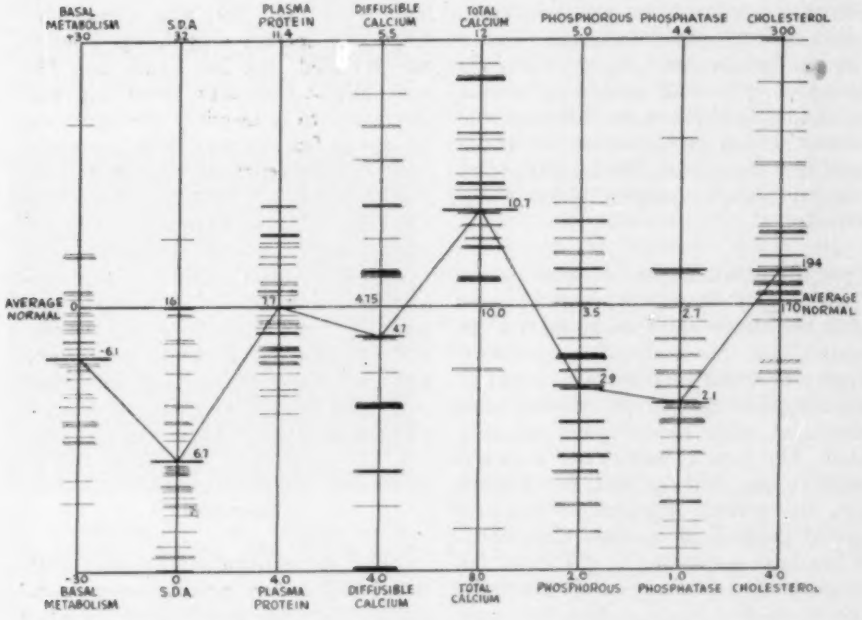


Fig. 3.—Results of laboratory studies compared with normal

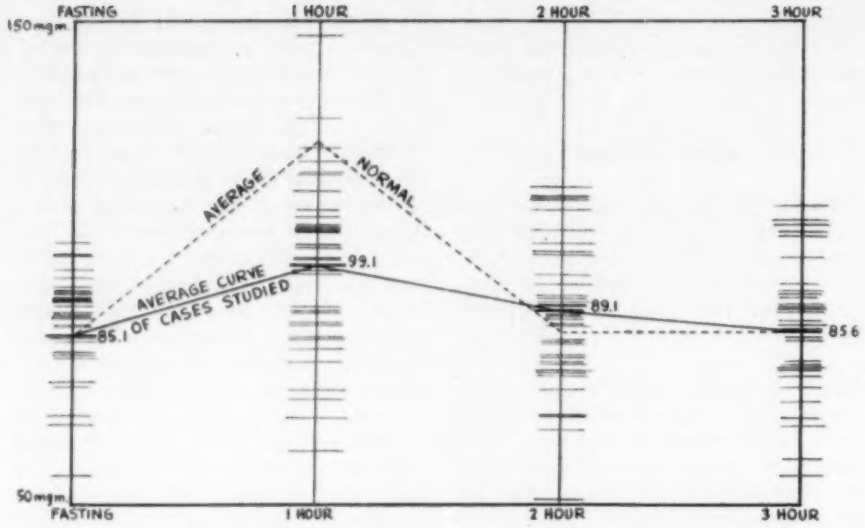


Fig. 4.—Average glucose tolerance curve of patients compared with normal

serum calcium was 11.3 mg. per cent; phosphorus was 2.6 mg. per cent; there was a reverse glucose tolerance curve. On oral examination (Fig. 5), pus could be expressed from all the first molars but not from the anterior teeth. Recession was evident only on the lingual surfaces of the maxillary first molars. She complained of bleeding from the gingiva of five years' duration.

Case 2.—A white girl, 16 years of age (patient 14), whose oral symptoms were of at least three years' duration, was admitted into this study. The childhood history disclosed that teething began at ten months of age with pyrexia and colds associated with the eruption of each tooth. The onset of menses was at eleven years of age, and up until five months ago, the periods appeared at regularly spaced intervals of 29 days. Since then, it has been appearing at 30- to 32-day intervals. From the beginning, the duration of the flow has been from five to six days and was moderate in quantity. There was no associated pain. The skin and hair were dry. She was overweight; height, 60 inches; weight, 132 pounds. She revealed that her hands and feet were almost constantly moist and that she tended to be inactive. The significant laboratory findings were: basal metabolic rate, −21 per cent; specific dynamic action of proteins, 6 per cent; cholesterol, 278.4 mg. per cent; flattened glucose tolerance curve. The oral examination (Fig. 6) revealed marked mobility of the lower incisors and first molars and profuse suppuration from deep gingival crevices. She complained of bleeding from the gingiva and sensitivity of the necks of the teeth due to recession of the gingival margins of the teeth.

Comments

All of the patients studied were white and comprised a heterogeneous racial group. There was some evidence pointing to the influence of hereditary factors.

There was usually a history that at least one of the parents of the patients suffered from "pyorrhea." However, in the parent this usually appeared at a somewhat later age. In a number of cases, in addition to the other procedures, roentgenograms were taken of the skull and long bones but no deviations from the normal could be discerned. The laboratory examinations revealed certain aberrations common to almost all the patients. In order to understand the significance of such deviations in this particular oral disease, further investigation suggests itself along the following lines.

1. To determine whether these patients have a negative calcium balance.

2. To determine the relation between the flattened glucose tolerance curve and the alveoloclasia. There is a possibility that the curve may be a secondary effect of the high carbohydrate diet.[6]

3. To determine the relation of the lowered specific dynamic action of proteins to this oral disease. It had previously been found[7,8] that the specific dynamic action is lowered as well in advanced alveoloclasia of older individuals.

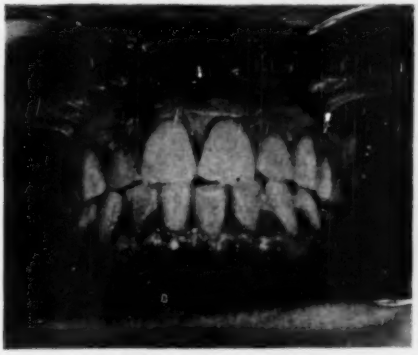


Fig. 5.—Patient 19, female, 15 years of age. Complained of bleeding gums of five years' duration. Pus could be expressed from all the first molars but not from the anterior teeth. Recession was evident only on the lingual surfaces of the maxillary first molars. Roentgenograms appear in Fig. 1

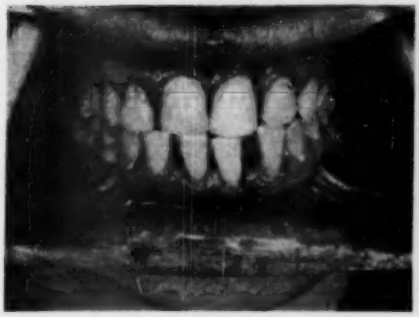


Fig. 6.—Patient 14, female, 13 years of age. Oral symptoms were of at least three years' duration. Anterior teeth and maxillary first molars were very mobile. Note the migration of the lower incisors. Roentgenograms appear in Fig. 2

4. The lowered phosphatase activity may be indicative of a decreased rate of osteogenesis, the rate of osteolysis remaining unaffected. Indeed, the orthodontist of one of the patients included in this study stated than on attempting to move the teeth, he noticed that osteolysis took place normally in front of the moved tooth but that new bone failed to form behind the tooth as would be expected. A previous study has shown that the level of phosphatase activity is a function of the glucose concentration.[9] When starving dogs whose phosphatase level had fallen were fed glucose, a prompt rise in phosphatase resulted. Thus, the flattened glucose tolerance curves which were obtained seem to bear directly upon this problem.

5. To determine the effects upon the oral structures of the cyclic changes which

6. Sweeney, J. S., Dietary Factors that Influence the Dextrose Tolerance Test: A Preliminary Study. *Arch. Int. Med.*, 40:818 (Dec.) 1927.

7. Weinmann, J., Connections Between Metabolic Disturbances and Peridental Lesions. Abstract. *J. D. Res.*, 11:503 (June) 1931.

8. Breuer, K., Basic Metabolism and Specific Dynamic Effect of Protein in Cases of Periodontal Disease. Abstract. *J. D. Res.*, 13:207 (April) 1934.

9. Bodansky, A., Jaffe, H. L., and Chandler, J. P., Experimental Factors Influencing Blood Phosphatase Values. *J. Biol. Chem.*, 97:lxvi (July) 1932.

take place, especially in females, during active sex life.

6. It is possible that the predominance of females in this study is due to the fact that fewer males have dental work performed. However, this is offset by the different roentgenographic picture of the alveoloclasia, which was more diffuse in the males. In addition oral symptoms seem to begin at a somewhat later age in the males.

Summary

1. Thirty-five cases of precocious advanced alveolar bone destruction were studied to determine a systemic relation. Local factors were insufficient to account for the widespread tissue damage seen in these cases.

2. Females comprised the great majority of the group (94.1 per cent). On the other hand, males were found to be slightly more susceptible in the later ages.

3. The dental roentgenograms were characteristic. An advanced alveolar bone destruction was seen chiefly in the incisor and first molar regions. On the other hand, roentgenograms of the skeletal bones revealed nothing unusual.

4. Eighty per cent of the patients consumed what appeared to be excessive amounts of carbohydrate. Past experiences have shown that restriction of the carbohydrate intake has been of considerable benefit.

5. The onset of the disease appears to be around puberty (about 13 years) or, especially in males, slightly later.

6. The significant mean laboratory deviations of the entire group were:

Basal metabolic rate, −6.1 per cent; specific dynamic action of proteins, 6.7 per cent (normal, 16 per cent); serum calcium, 10.7 mg. per cent (normal, 9 to 11 mg. per cent); cholesterol, 194.0 mg. per cent (normal, 150 to 190 mg. per cent); inorganic phosphorus, 2.9 mg. per cent (normal, 2.5 to 4.0 mg. per cent); phosphatase, 2.1 Bodansky units (normal, 3 to 5 B.U.). Glucose tolerance curve: fasting, 85.1; one hour, 99.1; 2 hours, 89.1; three hours, 85.6 mg. per cent (evident flattening).

7. A line of further investigation is suggested which would determine the relation of the various laboratory deviations to the oral condition, the possible existence of a negative calcium balance and the effect of the cyclic changes on the oral tissues.—*57 West 57th Street.*

▲

Teeth of Pre-school Child.—The teeth of a small child should not be disregarded by any physician. Very often, the doctor of medicine has the first opportunity to examine such teeth, and the advice given at the time may make a great difference in the condition of the child's mouth when he reaches school age and is brought forcefully to the attention of the doctor of dentistry. The United States has more dentists and better ones than any other country in the world, and work with children is their particular pride. Their services should be utilized.—*Child Welfare Page, "Hard Facts About Soft Teeth," J. Kansas M. Soc. 50:338 July 1949.*

VARIATIONS IN NATURAL OCCLUSION AND THEIR SIGNIFICANCE IN THE CONSTRUCTION OF PROSTHETIC RESTORATIONS

Henry A. Collett, D.D.S., Philadelphia

Five hundred and twelve patients were examined at the Naval Hospital, Philadelphia and some of the variations in the occlusion of their teeth were observed and recorded. The characteristics that received particular attention were the number of missing teeth, overbite, overjet, cuspal inclined planes, and the limitation to the mandibular excursion while the teeth were in occlusion.

Correctible discrepancies such as slight cuspal interferences to the mandibular excursions and interferences by extruded and exfoliated teeth were not recorded in the survey.

Those having complete restorations or so many teeth missing that their natural occlusion could not be determined were purposely omitted from the survey. The teeth missing in the patients examined varied from 0 to 12, the average being 4.3.

In the patients examined the vertical bite relationship varied from a 5 mm. open bite to 10 mm. of overbite. The average overbite was 2.49 mm.

The horizontal bite relationship of all examined varied from a 3.0 mm. prognathism to 10.0 mm. of overjet. The average overjet was 1.97 mm..

Twenty-five patients had an edge-to-edge bite of their anterior teeth; 11 presented a prognathism; 9 had cross bites of their anterior teeth; and 9 had open bite malocclusions.

The cuspal inclined planes of those examined varied from 0 degrees where marked attrition was present to 50 degrees. The average of the various cuspal inclined planes was 28 degrees.

For purposes of this study these patients can be divided into three groups: First, those that approach balanced occlusion because the excursions of the mandible are not limited when the teeth are in occlusion. Second, those that are limited in protrusive but have free lateral excursion. Third, those that are limited to centric position.

The occlusion of those examined was balanced—or nearly so as we know balanced occlusion in complete denture construction—in 54 per cent of the patients. That is, they had freedom of both protrusive and lateral excursions. The cuspal inclined planes of the posterior teeth were in harmony with the overbite and the overjet and allowed the mandibular anterior teeth to pass the maxillary teeth without interference when the mandible was moved through its various excursions.

The overbites of these balanced cases varied from 0 to 5.0 mm., the average being 1.27 mm. The horizontal relationship of the balanced cases varied from a 2 mm. prognathism to 5 mm. of overjet. The average overjet was 1.54 mm.

Nineteen per cent of the patients examined had free lateral excursion of the mandible, but were limited in protrusive by their excessive overbites. These patients presented overbites of from 1 to 10 mm. The average overbite was 3.8

Commander, DC, USN.

mm. The overjets presented by these patients whose mandibular excursions were partially limited varied from 1 to 10 mm.; the average was 3 mm.

The mandible was limited to centric occlusion in 26 per cent of those examined because of a relatively steep overbite and relatively little overjet. The overbites of these patients were from 2 to 10 mm. The average overbite was 4 mm. The overjets of these locked bites were from 1 to 5 mm. The average overjet was 1.5 mm.

Pre-Extraction Records and Complete Dentures

These findings suggest that if complete dentures were to be constructed for the patients examined the occlusion could be duplicated or nearly so in 54 per cent of the cases. Pre-extraction records such as photographs, casts of the natural teeth, acrylic face masks, contoured wire profiles and profile roentgenograms would be invaluable for the purpose of duplicating the conditions.

These findings also suggest that in 46 per cent of the cases examined, modification of the conditions present might be considered for the purpose of balancing the occlusion. The fact that the occlusion may be considered for modification does not make the pre-extraction records less valuable. They can be studied with this in mind. There seem to be several possibilities for modification of these conditions interfering with balance. First, the incisal edges of the maxillary incisors may be raised and the incisal edges of the mandibular incisors lowered. Second, the functional vertical dimension may be increased.

The first modification is more or less a question of esthetics. In some cases of extreme overbite the upper lip seems to be short and the patient shows more of his maxillary natural teeth than is desirable from a standpoint of esthetics. In these cases it seems that raising the incisal edges is indicated.

The second modification, raising the functional vertical dimension, should be practiced with considerable caution.

Thompson suggests that in patients with excessive overbite the rest position usually assumes normal incisal relationship while the occlusal surfaces of the posterior teeth are sometimes a quarter of an inch apart.[1] This statement indicates that the greater the overbite presented the more the freeway space when the mandible is in its rest vertical position.

A freeway space of at least 3 mm. seems to be desirable to prevent damage to the supporting structures of an appliance. In excess of twice 3 mm. seems to be present in many natural dentures. In these cases it is quite possible, and seems desirable, to utilize some of the excess freeway space to increase the functional vertical dimension for the purpose of balancing the occlusion, for esthetics of a replacement, and to prevent a functional overclosure. However, the operator should be particularly careful that the physiological limits are not exceeded.[1]

There seems to be no reason why both of these modifications should not be accomplished on the same case if it seems necessary.

The average cuspal inclined plane of the posterior teeth of those examined was 28 degrees. The cuspal inclines of posterior teeth on complete dentures still seem to be a matter of opinion. Swensen states that the prosthodontist has an opportunity to establish a reduced amount of displacing cusp inclinations and maintain a harmony that will not disturb the stability of the complete denture.[2] He also states that the stability of a denture

1. Thompson, J. R., and Brodie, A. G., Factors in the Position of the Mandible. *J.A.D.A.* 29:1925 (June) 1942.

2. Swensen, Merrill G., *Complete Dentures*. The C. V. Mosby Co. 1940, p. 436.

Fig. 1.—Incisal edges of the natural maxillary incisors extend 7 mm. below the lip at rest

varies with the cusp inclination.[3]

For a more stable complete denture in most cases it seems that the average cuspal incline found in the natural denture could be somewhat reduced.

Immediate Dentures

Occasionally it seems desirable to construct an immediate denture for a patient with an extreme overbite. It seems logical that if this condition is not modified damage may eventually be done to the tissues supporting the denture. This condition may also interfere with the retention and the stability of the denture.

Immediate dentures have many advantages. One of these is that it is possible to place the replacement teeth in the same position as the natural teeth in relation to the jaw and face. This same position can be maintained and the esthetics and mechanics possibly improved if the incisal edges are raised on some selected cases. The functional vertical dimension may also be increased within limits in some cases. If this vertical dimension is increased, it may be well to do it tentatively with a partial denture, replacing only the posterior teeth before constructing the complete immediate denture. In this manner the functional vertical increase can be observed for some little time before the immediate denture is completed.

Report of a Case.—The patient reported to the dental clinic with multiple caries and it was considered that the maxillary teeth with a few exceptions were beyond restoring. It was decided that an immediate maxillary denture was indicated.

The incisal edges of the natural maxillary anterior teeth extended 7 mm. below the upper lip at rest (Fig. 1). The overbite was 6 mm. and overjet 3 mm. The incisal edges of the mandibular incisors occluded with the cingulum of the maxillary incisors. There was a 6 mm. freeway space (Fig. 2).

The posterior maxillary teeth were extracted and an alveolectomy performed. A temporary maxillary partial was then constructed raising the functional vertical dimension 2 mm. The patient was allowed to wear this for ten days while the tissues were healing. This permitted study of the increase in the functional vertical dimension.

3. Same as 2, p. 456.

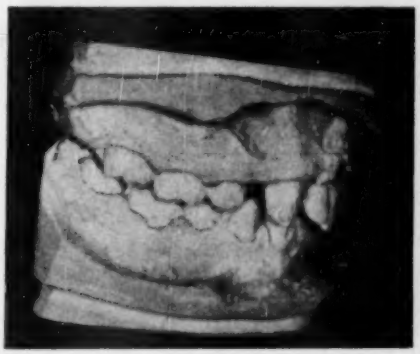


Fig. 2.—Study casts showing locked bite of patient for whom an immediate full maxillary denture was to be constructed

The immediate denture was then constructed raising the incisal edges of the maxillary incisors 3 mm. (Figs. 3 and 4).

These modifications were pleasing esthetically and permitted balancing of the occlusion in this case (Figs. 5 and 6).

Fig. 4.—The completed immediate denture compared with the original locked bite

Partial Dentures

Balancing the occlusion for partial dentures is one of the most important considerations in their construction.[4] Even if the design of a partial denture is perfect it is not likely to function efficiently if the occlusion is not right.

Most of us have seen partial dentures that functioned well even though the design was poor or the denture ill-fitting. If these dentures were examined closely it would often be found that the occlusion was good.

If partial dentures were to be constructed for the 512 patients examined in this survey, very little balancing of the occlusion could be done for 26 per cent of them because the occlusion was locked in the centric position by a steep overbite and very little overjet. The operator would be more or less limited to grinding the teeth to a good centric occlusion.

Nineteen per cent had free lateral excursion but were limited in protrusive by the overbite. Special consideration should be given to balancing the denture occlusion for these patients within the limits of their mandibular excursions. A partial denture that further limits the excursions of the mandible is very likely to be detrimental to the structures supporting it.

Fifty-four per cent of the patients examined presented a balanced occlusion of their natural teeth with the exception of slight cuspal interferences in some cases. If partial dentures were planned for these patients these cuspal interferences should be studied and corrected. Balancing the occlusion of these partial dentures should then be given the same consideration as would be given the occlusion of complete restorations.

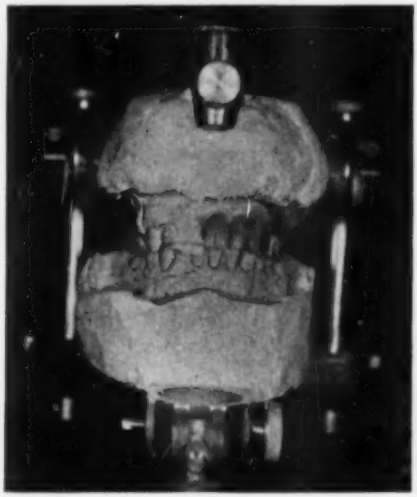


Fig. 3.—Illustrates modification of the incisal bite. The incisal edges of the replacement teeth have been raised 3 mm.

Mouth Rehabilitation

Occasionally patients with extreme overbite may present temporomandibular symptoms or show a breaking down of the supporting structures of the anterior teeth. These patients should be carefully studied and their occlusion considered for correction by raising the functional

4. Collett, H. A., Balancing the Occlusion of Partial Dentures, to be published.

vertical dimension within the physiological limits.[5, 6, 7] There seem to be two general methods of treatment for these cases. One is with fixed appliances and the other is with removable appliances. If a fixed appliance is decided on, it may be well to construct first a temporary removable appliance and study the condition for some little time while the patient is wearing this removable appliance. If this test appliance answers the requirements of the raised functional vertical dimension and is within the physiological limits, it may be considered safe to construct the fixed appliance using the same vertical correction.

Report of a Case.—The patient reported to the dental clinic complaining that the anterior region of the hard palate was swollen and bleeding. He first noticed the symptoms about three weeks before he reported for treatment.

General Physical Findings.—The mandibular incisors were biting into the hard palate (Fig. 7). There were impressions of the incisal edges, 2 mm. deep, in the hard palate just lingual to the maxillary incisors. The mandible was being forced beyond normal retrusion by the occlusion of the incisal edges of the mandibular incisors with the lingual surfaces of the maxillary incisors. The lingual surfaces of the maxillary incisors showed considerable wear in the area of the cingulum. The maxillary incisors had moved several millimeters protrusively (Fig. 8).

The patient was found to have a freeway space of about 6 mm. in his rest vertical position. There was an overbite of 10 mm. and an overjet of 11 mm.

Treatment.—A removable gold onlay appliance was constructed, opening the functional vertical position 2.5 mm. and allowing a freeway space of 3.5 mm. in the rest vertical position.

For esthetic reasons the protruding four maxillary incisors were extracted and an alveolectomy performed(Fig. 9). They were replaced with a fixed bridge.

5. Mershon, J. V., Bite Opening Dangers, *J.A.D.A.*, 26:1972 (Dec.) 1939

6. Tench, R. W., Dangers in Dental Reconstruction Involving Increase of the Vertical Dimension of the Lower Third of the Human Face, *J.A.D.A.*, 25: 566 (April) 1938.

7. Harris, H. L., Diagnosis in Closed Bite Conditions, *J.A.D.A.*, 26:964 (June) 1939.

Figs. 5 and 6.—The immediate denture in place. The modification is pleasing esthetically and permits balancing of the occlusion

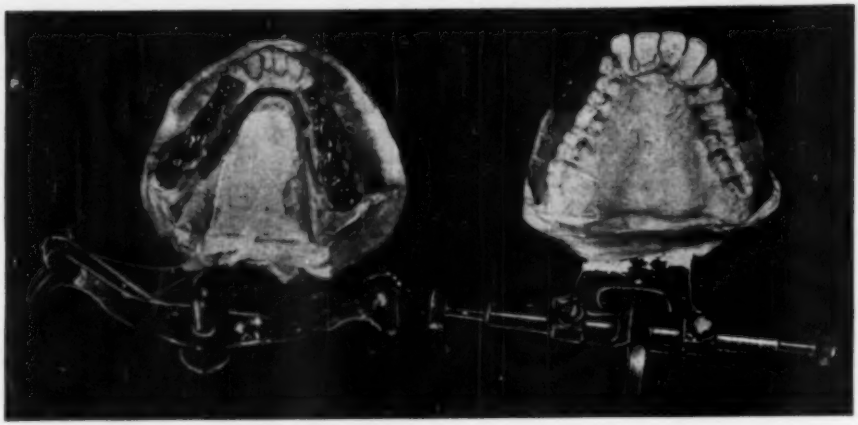


Fig. 7.—Completed removable onlay appliance on the cast. Two millimeter impression of the incisal edges of the mandibular teeth can be seen in the mucous membrane just lingual to the maxillary incisors

The incisal edges of the pontics were raised 3 mm. for improved esthetics (Fig. 10). Sufficient space was allowed lingual to the bridge so that it would function without the removable onlay appliance in place. This was done so that the supporting structures of the bridge abutment teeth would not be damaged should the removable appliance be lost or broken. (In the Navy a patient on foreign or sea duty might lose or break a removable appliance and not be able to obtain a replacement immediately.)

Conclusion

1. Modification of the occlusal conditions present in the natural denture seems necessary in about half of the patients for whom dentures are constructed (46 per cent of the patients examined in this survey).

2. Modifications of conditions present in the natural denture might be made by raising the incisal edges of the incisors, reducing the cuspal inclined planes of the posterior teeth, and by increasing the functional vertical dimension within the physiological limits, when dentures are constructed. These modificatons may be more esthetic and permit easier balancing of the occlusion of the replacements in selected cases.

3. Twenty-six per cent of those examined presented an occlusal condition that completely limited the excursions of the mandible when the teeth were in

Fig. 8.—Completed appliance on the cast. The maxillary incisors have been moved labially by the closed bite condition

Fig. 9.—The natural maxillary incisors as they appeared before treatment

Fig. 10.—Completed case. The incisal edges of the pontics were raised 3 mm. for improved esthetics

occlusion. If partial replacements were constructed for these patients the teeth could only be ground to a good centric occlusion; however, special consideration should be given to balancing the replacement occlusion within the limits of the natural occlusion in the remaining 74 per cent.

4. A deep overbite may be indicative of overclosure of the mandible and in some cases may be detrimental to the natural denture or the temporomandibular joint. These cases may be considered for rehabilitation.—*5722 Willows Ave.*

The opinions or assertions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

▲

Plight of the Specialist under British National Health Service.—"The results of grading specialists have caused great dissatisfaction in all parts of the country. Much of this dissatisfaction is due to the fact that the Assessment Committees in various regions interpret their duties differently. Thus, in one region the criteria for grading are, to the outside observer, far stricter than those in an adjacent region. This inequality naturally causes sharp resentment and a feeling of injustice. As our correspondence columns show, some men blame the Ministry of Health for this, while others suggest that the B.M.A. [British Medical Association] or the Joint Committee should act to put matters right. It is therefore, in the first place, important to make it clear with whom the responsibility for grading lies."—*British Medical Journal, No. 4620, July 23, 1949, p. 220.*

A COMPLETE BRIDGE TECHNIC UTILIZING THE ALGINATE HYDROCOLLOIDS

Kenneth R. Pfeiffer,* D.D.S., and
Frank E. Jeffreys,† D.D.S., Bethesda, Md.

A SEARCH of the dental literature shows a wealth of material stressing the importance of a complete roentgenographic examination prior to the construction of a fixed partial denture or bridge. Much progress is also reported in esthetics, sanitation, abutment preparations, pontic design and in the technical procedures involved. The informed observer, however, will readily note the absence of material on the application of the science of occlusion to bridgework.

The standards by which a fixed partial denture is judged have changed in recent years. Modern laboratory procedures make the construction of a perfectly fitting crown or bridge commonplace; an artistically matched, shaded and stained facing or pontic is no longer a novelty. Harmony in function is the standard by which a restoration is judged today. No matter how perfect the margins are or how expertly matched the facings, if the occlusal surfaces of the new restoration are not shaped to function in harmony with the remainder of the teeth, the requirements of modern crown and bridgework have not been met.

In the past, restorations have been made only to preserve a tooth or to fill a gap in the dental arch. Crowns and bridges were constructed to restore teeth individually or in small sections of the arch, but seldom did they transform it into a healthy functioning machine.

All prospective bridge patients are dental cripples in varying degrees, depending upon the number of missing teeth and other forms of dental pathosis present. A studied examination will usually reveal the presence of mobile and drifting teeth, elongated and malposed teeth, and varying degrees of cuspal interferences, all of which add up to a poorly functioning mouth.

When treating these patients, it is fundamentally sound to assume that all the forces exerted by the muscles of mastication should be as equally distributed throughout the remaining teeth as is mechanically possible. The correction of these forces or equilibration of occlusion must be accomplished before the abutment preparations are begun and then must be maintained throughout the construction of the prosthesis. If this procedure is not followed, some of the remaining teeth will be overloaded by poorly distributed stresses, resulting in a more rapid destruction of the supporting bony structures than otherwise would occur.

Presented before the following societies: Louisville District Dental Society, Louisville, Ky., Dec. 16, 1948; Postgraduate Clinic, District of Columbia Dental Society, Washington, D. C., March 15, 16, 1949; Kentucky State Dental Association Annual Meeting, Louisville, Ky., April 6, 1949; Northeastern Dental Society Annual Meeting, Swampscott, Mass., June 6, 7, 1949; Miami Dental Society, Miami Fla., Oct. 10, 1949.

* Formerly Associate in the Prosthetics Division, U. S. Naval Dental School, Bethesda, Md. At present associated with the Veterans Administration as Assistant Chief of Research and Education Division, Dental Service, Washington, D. C.

† Formerly Associate in the Prosthetics Division, U. S. Naval Dental School, Bethesda, Md. At present Commander, U. S. Navy Dental Corps, stationed aboard the USS Consolation.

In compliance with Article 1252, U. S. Navy Regulations 1948, the opinion or conclusions contained in this article are those of the authors. They are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

Therefore, the correctly reconstructed mouth will show occlusal surfaces which have been altered and shaped to provide an equalized stress between as many of the remaining teeth as possible in all lateral and protrusive excursions, as well as in centric relation. The highest degree of efficiency of the masticatory apparatus will thus have been established.

Equilibration of Occlusion

Equilibration of the occlusion is usually expressed either in vague generalities or in so much detail[1] that it remains a confusing mystery to those who do not already fully understand it. As a guide for these operators a simple but comprehensive and organized procedure is presented.

The initial detection of the teeth or cusps in supraocclusion usually can be done at a glance and corrected by reducing with small stones and discs. When these gross imbalances can no longer be detected by sight, carbon articulating paper is used to locate the points of contact requiring further reduction. Ordinary dental articulating paper is practically useless for this type of work as it is too thick and its surface is so soft that it will rub off on a tooth, producing a carbon mark, even though the tooth may actually be out of contact with its opposite. A thin, hard typewriter carbon paper is recommended. This is cut into strips about 3/8 inch wide and 1½ inches long, and held in a hemostat. The patient is instructed to tap his teeth together repeatedly in the required relation while the carbon paper is moved from tooth to tooth.

As a state of equilibrium is approached, even this thin carbon paper may supply inaccurate markings and should be replaced with a soft, dark wax as a disclosing medium. The teeth are dried and a thin layer of wax is pressed over them. The patient is instructed to close in the desired position and all points of contact will be seen, showing very clearly through the dark wax.

A plaster matrix should be made against the external surfaces of all mobile teeth. This matrix should be made with the mouth open and the teeth out of occlusion. Its use will stabilize a group of mobile teeth and enable true and accurate markings to be recorded.

The first phase of occlusal equilibration is to reestablish the general plane of occlusion in harmony with the anteroposterior and lateral compensating curves. Check the general curvature of the buccal cusps of the maxillary teeth carefully and reduce to this plane any cusps that extend below it to the extent that they interfere with the lateral or protrusive excursions. In a similar manner, check and correct the length of the lingual cusps of the upper teeth and finally the length of the buccal and lingual cusps of the mandibular teeth. As a rule only malposed, extruded or tilted teeth require reduction to reestablish the curvatures of the occlusal plane. Next, have the patient close his teeth repeatedly but lightly in centric occlusion to ascertain whether or not any one or two teeth come into premature contact with their opposites. The patient's observation may be augmented by placing the index finger over two or three teeth at a time so as to feel any thrust on the teeth when the patient closes. If premature contact is detected, correct it by grinding both upper and lower offending teeth until as many teeth as possible are brought into contact at exactly the same moment in the centric position.

The patient is now trained to open and close the mouth so that the buccal cusps of the upper and lower teeth come into contact in the right lateral position. With the mandible in this lateral relation, any

1. Schuyler, Clyde H., Correction of Occlusal Disharmony of the Natural Dentition. New York, D. J. 13:445 (Oct.) 1947.

teeth in a state of supraocclusion are noted. Very often the upper and lower cuspids and possibly the lateral incisors will be the only teeth in contact; the bicuspids and molars may be completely out of occlusion. Any grinding on the upper cuspid and lateral incisor should be in harmony with the esthetic factor. This initial reduction is performed at the expense of the mandibular cuspid and lateral incisor. The height of these teeth in the right lateral position is reduced by means of a small abrasive stone or by a diamond wheel until one of the posterior teeth on that side comes into contact. The altering of the posterior teeth on the right side then continues by reducing the buccal cusps of the upper and the lingual cusps of the lower teeth.

As this reduction of the teeth on the right side progresses, contact may develop between the upper and lower left posterior teeth. Reduction of these teeth will be required and is accomplished by grinding on the inclined planes of the lingual cusps of the uppers and the buccal cusps of the lowers. Simultaneous reduction of all teeth is then carried on until as many of the posterior teeth are brought into contact in the right lateral position as is feasible. Sometimes every tooth can be brought into perfect contact with its opposite but frequently the alignment and arrangement of the teeth will preclude such perfect results.

The patient is next trained to close the mandible in the right lateral position and to slide into centric occlusion. Markings disclosed during this movement are reduced slightly but repeatedly until all interferences have been removed and the desired harmony established.

The teeth are next corrected in the left lateral relation and then in the protrusive relation following the same principles. Coarse pumice or abrasive paste is spread on the mandibular teeth and the patient directed to mill the teeth in all directions for a few minutes in order to remove all minute imbalances. This milling should not continue long enough to close the vertical dimension.

Examination of the teeth will disclose flattened areas or facets that have been formed on the occlusal surfaces. These flattened areas must be altered and reshaped to increase the efficiency and to lessen the strain on the teeth. The mesial and distal portion of each area is shaped with a small stone to keep the crest of the facet in occlusion and to form spillways on each side of it. Polish with small rubber points and discs.

The illustrations shown in Figures 1 to 4 demonstrate the patient's occlusion before and after equilibration, as well as the finished multiple fixed bridges.

Cavity Preparation

Cavity preparation in crown and bridge work has been thoroughly and amply covered in many textbooks and articles and is beyond the scope of this paper.

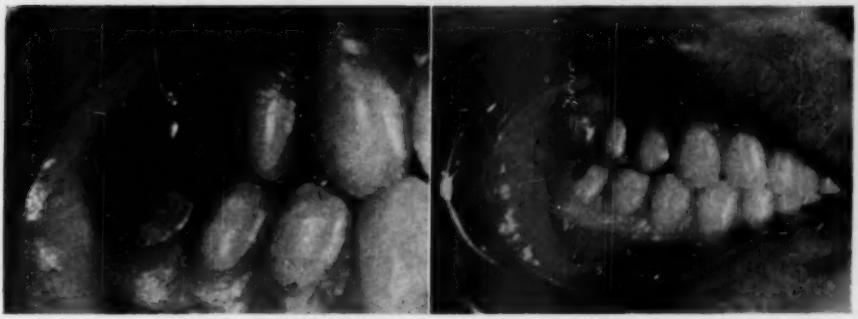
Impression Technics and Factors

Excellent results can be obtained by the various direct and indirect methods[2, 3] or combinations thereof, and it is urged that the practitioner of restorative dentistry master several methods of fabrication so as to understand and to be able to take advantage of the good properties of all the available impression materials and technics. The operator who has mastered a variety of technics can more wisely evaluate the influential factors of each case and select the procedure which will produce the best possible results.

The factors which influence the selection or rejection of a technic for a given

2. Kendrick, Z. Vance, Sears Hydrocolloid Impression Technic in Restorative Dentistry. *J.A.D.A.* 33: 445 (April) 1946.

3. Eisenstark, J., Simplified Technic for Construction of Gold Inlay. *J.A.D.A.* 34:801 (June) 1947.



Figs. 1 and 2.—Right lateral position before and after treatment

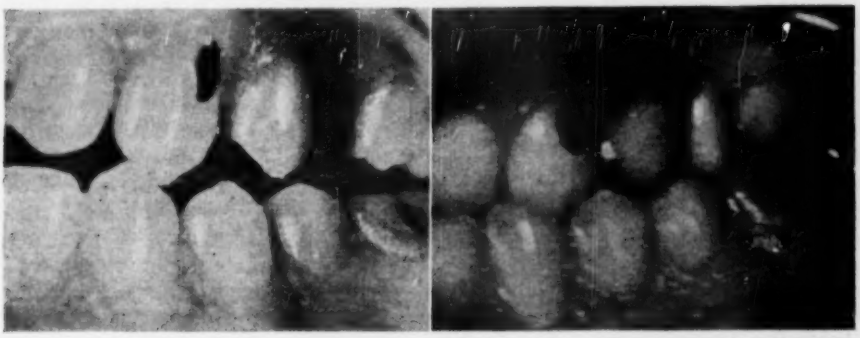
case are as follows: (1) type of patient, (2) location in the oral cavity of the proposed prosthesis, (3) condition of the prepared teeth, (4) ability of the operator to manipulate the necessary materials, (5) value of the dental chair time, (6) ability and value of the dental assistant, (7) quality and quantity of available laboratory assistance.

An indirect technic making possible the fabrication of multiple fixed bridges or inlays from one impression of the involved dental arch will be described.[4] This technic will shorten the chair time required, reduce the number of visits by the patient and be less fatiguing to both operator and patient than many of the other methods now commonly employed.

This technic has been used for the past three years. During this time it has been applied to a great variety of crown and bridge cases. Carefully kept records show that it was possible to use it successfully in approximately 70 to 75 per cent of all routine work.

The determining factor for the use of the hydrocolloid impression materials is the availability of all the margins of a

4. U. S. Naval Dental School Handbook for Dental Prosthetic Technicians. Bethesda, Md., U. S. Naval Dental School, 1948.



Figs. 3 and 4.—Left lateral position before and after treatment

preparation. All margins of a prepared tooth must be completely visible since the alginate base hydrocolloids are too soft and too fluid to displace any gingival tissue. Any margins of the preparation which are below the free margins of the gingivae must be made visible by retracting the tissues using one of the following methods:

1. Kite string or heavy yarn may be ligated around the tooth. A blunt instrument is used to force it tightly against the gingival tissue where it should remain for five to ten minutes.

2. An astringent such as 5 per cent zinc chloride may be applied for five to ten minutes.

3. A small orthodontic or surgical rubber band may be used as a ligature for five to ten minutes.

4. The rubber dam will afford immediate displacement around individual teeth but complicates the obtaining of an accurate impression of the edentulous ridge areas.

5. Temporary stopping may provide the required retraction when tightly packed in the preparation for ten minutes.

6. Aluminum or celluloid crown forms filled with zinc oxide and eugenol mixture can be used when the impression is to be taken at a later sitting.

7. Electrocautery may be indicated to remove excess tissue surrounding partially erupted teeth.

8. Surgical removal of involved gingival tissue may be used in combination with application of a crown form for several days.

The alginate base hydrocolloid impression materials are contraindicated when all the margins cannot be made completely visible. In these cases, a technic employing an impression material or procedure which will displace the gingival tissue must be selected.

Impression Armamentarium.—Three cubic centimeter Luer-type syringe fitted with an 18-gage curved needle about one inch in length; plaster bowl and spatula; ice water; alginate-base hydrocolloid impression material; clock or interval timer; small cement or silicate spatula; nonperforated impression tray with means of retaining impression material.

Taking the Impression.—The setting or gelling time of the alginate hydrocolloid can be extended from five minutes to seven minutes to provide the operator with additional working time. This is accomplished by using ice water instead of water of room temperature or 70° F. The bowl, spatula and syringe are also chilled to aid in slowing the setting of the material. Fifty-six cubic centimeters of ice water are used instead of the usual 50 cc. to thin the mixture sufficiently for ejecting easily and evenly from the syringe and needle.

The prepared teeth are rinsed with water; cotton rolls are then placed and the impression areas dried with an air syringe or cotton pellets. Fifty-six cubic centimeters of ice water are measured and placed into the rubber bowl. One package of the impression material is added to the water; the interval timer is set for seven minutes and started immediately. The mixing is performed vigorously and is completed at the end of one minute. The operator uses a small cement spatula to fill the syringe with 1.5 to 2.0 cc. of the impression material. This material is ejected into and around the prepared teeth by the dentist while the assistant fills the impression tray. In ejecting the impression material, the preparation first should be filled at the bottom or gingival aspect so as to force out any retained air and prevent bubble formation. The impression tray is next vibrated to place. The assistant should flush and clean the syringe and needle immediately after its use to remove any remaining impression material before it gels. Approximately three minutes will have lapsed up to this point, leaving four

Fig. 5.—Articulating key

Fig. 6.—Model attached to articulating key

Fig. 7.—Base of model serrated

minutes for the alginate to gel. On the signal from the interval timer indicating the expiration of the seven minutes, the impression is removed from the prepared teeth. The force used in the removal of the impression should be exerted quickly and in a direction parallel to the prepared teeth. The impression is checked for air bubbles or distortions. An impression of the opposing teeth is also taken at this sitting.

Laboratory Procedures.—The impressions are poured immediately by vibrating a thick mix of artificial stone into them. If not poured at once, the alginate impressions will shrink when left exposed to the air or will expand if immersed in water. Following the initial set of the stone, the poured impressions are immersed in a bowl of room-temperature water for thirty minutes, after which they are separated and trimmed.

A serrated jig or articulating key (Fig. 5) is positioned on an articulator and the master model is mounted against this key with a mix of stone (Fig. 6). The serrations thus formed in the base of the mounting permit the cast to be removed from the key and then replaced on it quickly and accurately (Fig. 7).

The model is next cut into sections, making the margins of the prepared abutment teeth more accessible. A laboratory saw is used to cut through the mounting and the model to within 1 mm. of the interproximal space between the abutment tooth and its adjacent tooth. A knife blade is inserted into the cut and twisted in such a way that the model will split apart between these teeth (Fig. 8).

The proximal surfaces of the teeth adjacent to the abutment teeth are scraped to insure adequate contact in the finished appliance. The gingival tissue area of the model is cleaned and may be trimmed carefully to provide better access for the waxing, carving and finishing of the attachments. The abutment castings will be constructed on the sectional model instead of on separate dies. The sectioned model is reassembled on the articulating key to check the relationships during the

Fig. 8.—Model after splitting

Fig. 9.—Model assembled on key

various steps of the waxing and finishing of the attachments (Fig. 9).

Before the waxing process is begun, the various sections of the model are lubricated by wiping with a cotton pellet saturated in a light oil or impregnated with oil in a vacuum. For inlays and deep preparations, the wax is softened and forced into place by finger pressure. For full crowns and three-quarter crowns, the wax is best applied by repeatedly dipping the preparation model into molten wax until covered sufficiently. All excess wax is trimmed off and the patterns carved to the required shape. Great care must be taken to avoid scraping or marring the margins of the model; the use of a slightly warmed instrument with an ironing-like movement is suggested for contouring the margins.

After the abutment castings have been made and are in position on the model (Fig. 10) the same reassembled model is used in the construction and assembling of the bridge or bridges. The edentulous ridge areas are prepared by scraping to a depth of approximately 1 mm. to insure contact of the finished and polished pontics against the tissue.

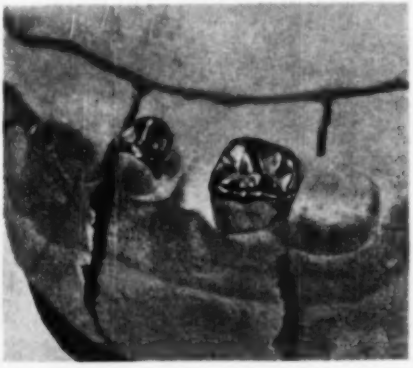


Fig. 10.—Castings in position on model

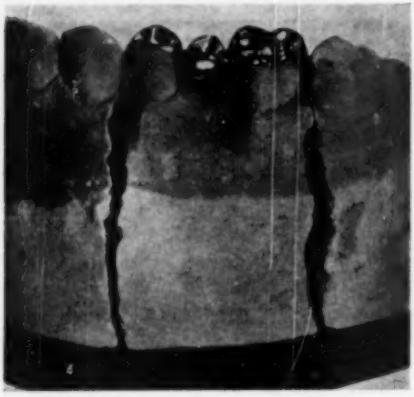


Fig. 11.—Cast pontic in position on model

The abutment castings are positioned securely on the model with sticky wax and the edentulous areas are lubricated with oil. Softened inlay wax is pressed into the area formerly occupied by the missing teeth. While the wax is still soft, the articular is closed to obtain the bite registration and landmarks of the opposing teeth, to be used as guides for contouring the pontics from the wax.

The wax is chilled and carved to the form of the crowns of the missing teeth.

A sufficient amount of the buccal and gingival portions of the wax pontic is cut away to provide space for the acrylic facing. A tunnel is made through the wax form from the buccal to the lingual aspect inclined toward the gingival, with the wax at the buccogingival line angle remaining as the retention loop for the acrylic. The wax pattern is smoothed, then sprued, invested, cast, and polished.

The pontic is positioned on the model and secured with sticky wax. (Fig. 11.)

Plaster is poured over the occlusal surfaces of the pontic and the abutment castings to form an occlusal matrix or alignment block. When the plaster has set, it is removed and the rough edges are trimmed and smoothed. (Fig. 12.)

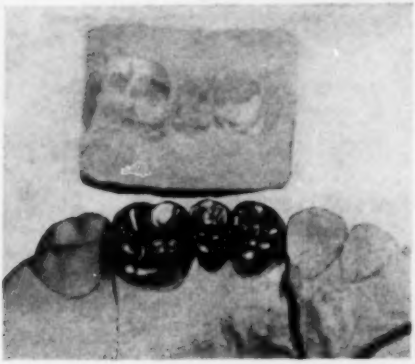


Fig. 12.—Plaster alignment block

The castings and the pontic are removed from the model and fastened in position in the alignment block with sticky wax. Soldering investment is painted onto the metal castings; the assemblage is then inverted and forced into the remainder of the mix, previously poured into a small soldering ring made by lapping and pinching together the ends of a 5-inch strip of matrix band steel. Use of a metal soldering ring provides a reinforced investment of small bulk, making soldering easier and quicker. After the investment is set, the alignment block is removed. The pontic and abutment castings are soldered, polished and replaced on the model. (Fig. 13.)

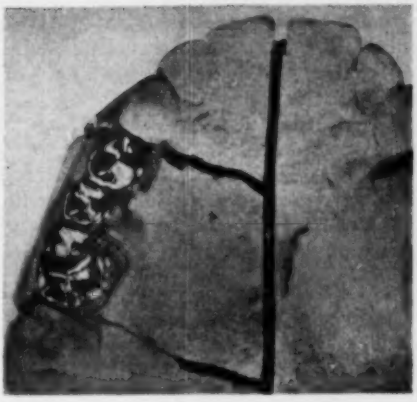


Fig. 13.—Framework completed

Wax is then forced into the buccal and gingival portions of the pontic, and carved to form a facing of the required shape. The bridge is then flasked, boiled out, packed with acrylic resin and processed in the usual manner. The acrylic facing is finished with fine disks, pumice and whiting. (Fig. 14.)

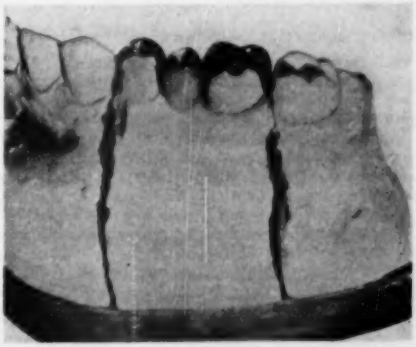


Fig. 14.—Bridge completed on master model

Completion of Bridge.—Final adjustments, such as contacts, occlusion, pontic contacting tissue, and cementation of the bridges are executed during the second visit of the patient.

Summary

The general limitations of the alginate hydrocolloid impression technic[5] can be summarized as follows: The alginate hydrocolloids are entirely acceptable as impression materials in all cases where the gingival margins of the preparations are visible or can be made visible and accessible for the impression taking.—
8375 Colesville Rd., Silver Springs, Md.

5. Skinner, E. W., and Pomés, Carlos E., Alginate Impression Materials: Technic for Manipulation and Criteria for Selection. *J.A.D.A.* 35:945 (Aug.) 1947

▲

Word Economy.—There has always been a need for shortening papers, but today this is becoming acute. With the soaring costs of printing and production, editors and publishers of journals are being compelled to cut down the number of pages per volume. A journal which, in 1947, made money may today be facing a deficit.

Another difficulty is that today no man can keep up with all that is being published, even in his specialty. Under these circumstances, the writer whose papers are most likely to be read is the one who makes them short and interesting. If he interrupts his text with boring material, many readers will quickly turn over the pages to the next article.

There probably never was a good paper which was not worked over several or many times. The writer will do well to search through his pages for every sentence and word that can be deleted without taking from the essential message. Every sentence that is vague should be rewritten until it can have but one meaning and that an obvious one. Finally, the writer who would have his papers widely read will do well to use, when possible, the short Anglo-Saxon word rather than the long one of Latin or Greek derivation. This makes for easier reading; and the tired doctor, when he comes home at night from what he hopes is his last call, much appreciates easy reading, with simple English words and short and simply constructed sentences. —*Walter C. Alvarez, The Need for Shortening Scientific Papers, Proceedings of the Staff Meetings of the Mayo Clinic 24:442, 444 (August 17) 1949.*

THE Journal OF THE
AMERICAN DENTAL ASSOCIATION

JANUARY 1950 • VOLUME 40 • NUMBER 1

LON W. MORREY, D.D.S., *Editor*

Published by the American Dental Association • 222 East Superior St. • Chicago 11, Ill.

EDITORIALS

SIX NATIONAL GROUPS JOIN FORCES TO IMPROVE HEALTH OF THE NATION

THE formation of an Inter-Association Committee on Health,[1] announced November 14, establishes for the first time in the United States an organization that formally represents six of the major national groups concerned with health and public welfare.

The American Dental Association, the American Hospital Association, the American Medical Association, the American Nurses Association, the American Public Health Association and the American Public Welfare Association have joined forces for the purpose of studying and improving the public health and welfare. The objectives of the new committee are:

> To study and discuss various phases of health care in the interest of improving the health of the nation. It shall serve as a means for the exchange of information on the programs and interests of the participating organizations to the end that, insofar as possible, a common understanding may be reached toward the solution of health problems of mutual interest encountered in these programs. The Committee shall perform such functions and carry on such activities contributing to the major objectives as may be satisfactory to the appointing organizations.

The public, as well as the members of the participating organizations, will follow with interest the deliberations of the new committee. Its members, consisting of the officers or members of the policy-making bodies of the six organizations, have demonstrated their ability and desire to help solve the many complex health and welfare problems that still confront this country. Unhampered by government regulations or

political aspirations, the committee will be able to attack this problem in the same deliberate, scientific manner that has been used so successfully in preventing or controlling many of the specific and communicable diseases that have plagued mankind in the past.

The establishment of the Inter-Association Committee on Health represents a decided forward—but long overdue—step in the public health field. Bringing together as it does, the resources, experiences and leadership of the country's leading private health and welfare agencies, it is destined to make a major contribution to the health standards of the nation.

1. Inter-Association Committee Formed to Seek Improvement of the Nation's Health. *J.A.D.A.* 39:374 (December) 1949.

POSTGRADUATE DENTAL EDUCATION:

A RESPONSIBILITY OF PROFESSIONAL EDUCATORS

MEMBERS of the dental profession are becoming more aware each year of the benefits resulting from further training and education. This awareness is shared equally by those who plan to take specialty board examinations and those who simply desire to improve the technics employed in general practice. Dental schools, each year, receive more inquiries about graduate, postgraduate and refresher study and are responding to these requests by developing more adequate postgraduate courses. Dental societies continue to sponsor special study groups, many of which have become so successful that they have gained national recognition. Although no exact count has been made in recent years of the number of such groups in existence, it seems safe to assume that their number is increasing. Dental schools have demonstrated their interest in the development of study group programs as is indicated by the University of Illinois telephone program.[1] Dental schools as well as graduate teaching institutions are participating actively in the development of dental residency and internship programs of hospitals.

There are many ways by which the dentist can supplement his education. It can be done best by the formal methods indicated above, that is, by taking advantage of the advanced courses given at the dental schools and by the graduate schools at the various universities, by participating in dental study courses or by obtaining an internship or residency in a recognized hospital. There are, of course, other and more informal methods by which dentists may supplement their education such as reading the recognized dental journals, consultation and attending clinics and professional meetings. In the past many dentists were forced by circumstances to rely largely upon the demonstration clinics of dental dealers and manufacturers for their supplemental education. Indeed, for many years many dental commercial concerns have demonstrated a strong interest in education for the profession and in some instances for the public as well. On the whole, however, such education has consisted

of demonstrations of the manufacturers' products and of the technics employed in their use. Occasionally a commercial concern has extended its educational activities by offering visual aids, literature and radio material to the profession and by preparing materials for the conduct of special refresher courses. All of which, no doubt, has contributed generally to the wider spread of knowledge.

The time is long since past, however, when dentists who wished to assure their professional advancement could depend solely on the occasional commercial clinic or on educational courses offered by persons untrained in educational procedures. The planning of curricula and the formulation of specifications for postgraduate courses rightly belongs to professional educators. The prestige which dentistry now enjoys, the position the profession holds in the healing arts and its desire to improve its services in the future make it imperative that dental education, whether it be for the undergraduate or the graduate dentist, be given under the guidance of those who make a career of dental teaching. It is undoubtedly for that reason that the House of Delegates[2] at its last meeting opposed in principle programs of supplemental education that were not controlled and administered by those recognized in the field of dental education.

1. Postgraduate Courses by Telephone: Electronics Aids Education. *J.A.D.A.* 39:348 (September) 1949.
2. Report of Actions of House of Delegates, 1949. *J.A.D.A.* 39:608 (November) 1949.

HYGIENISTS IN MASSACHUSETTS TO RECEIVE TRAINING IN DENTISTRY FOR CHILDREN

THE Commonwealth of Massachusetts has revised its dental practice act within recent months to permit the State Department of Public Health to train feminine personnel to fill cavities in children's teeth under the supervision of a dentist in dispensaries or clinics.

The training course, designated at the moment as a research program, is to be given at the Forsyth Dental Infirmary in Boston. Under the present law the program is limited to a period of five years, the first two of which will be devoted to training the students and the last three to evaluating the services rendered by the trainees. The project, financed by the Children's Bureau of the Federal Security Agency, has not been endorsed by the governing body of the Massachusetts Dental Society although the research committee of the society has approved it in principle.

Needless to say this new project is viewed with concern, not only by members of the Massachusetts Dental Society but by members of the profession throughout the entire United States. This concern is engendered first by the fact that the act provides two-level dentistry and second by the fact that the dental practice act of Massachusetts was revised without full knowledge of the profession in that state.

The House of Delegates of the Association in October last year voiced its disapproval of the project by passing the following resolution:

Resolved, that the American Dental Association deplores the apparent failure of the Massachusetts State Legislature to approach the Massachusetts State Dental Society preparatory to inaugurating this program without the knowledge and the endorsement of the American Dental Association, and be it further

Resolved, that all such programs concerning the development of sub-level personnel, whether designed for experimental purposes or otherwise, should be planned and developed only with the knowledge, consent and cooperation of the respective state associations and the American Dental Association for the purpose of protecting public health and welfare.

There is no question that serious consideration must be given to improving and extending dental service to children, but the present Massachusetts program is open to question as it will simply lower the standards of dentistry without effecting a permanent solution of the problem. Years of study have been given by the best minds in dental and educational circles to improve dental education and to regulate the practice of dentistry. It is not in the best interest of the public to destroy or even endanger the results of such study without serious deliberation and without full consideration of the scientific viewpoint of those who have labored so hard to safeguard the health of the public.

INTERNATIONAL CORRESPONDENCE

NEWS FROM GREAT BRITAIN

The three dental associations in Britain are past history. There is now one dental association to speak for British dentistry. At the extraordinary meetings of the three associations called to approve the amalgamation resolutions there was one dissentient vote at the British Dental Association meeting, two at the Public Dental Service Association meeting and the voting at the Incorporated Dental Society meeting was 439 for amalgamation and 109 against.

The School Dental Service

As has been mentioned in this letter from time to time, the School Dental Service has been severely handicapped since the introduction of the National Health Service. The salaries offered by Local Authorities to their dental officers are very much less than the incomes obtainable by private practitioners in the N. H. S. Dental officers have therefore left the public service to enter the Health Service as private practitioners, influenced largely by the immediate prospect of a better income.

In the latter half of 1948 it was plain that the discussions to improve the salaries of the public dental officers were going to be protracted and even today there is no agreement in sight. A recent incident makes it worth while to view the whole position. The dental officers had a grievance long before the introduction of the N. H. S., in July 1948. In January of that year the Local Authority medical officers were awarded a salary increase effective from the previous October but dental officers were excluded. After a considerable time, discussions of the dentists' protests took place but with adoption of the Spens Report income of £1,600 ($4,480) a year for a general dental practitioner it was obvious that the public dental officers would not be content with a percentage increase in salary comparable to what their medical counterparts had received.

In July 1948 therefore the Ministry of Health called a meeting of representatives of Local Authorities and the dental profession. An exploratory discussion was held but no agreement was reached. The Local Authorities suggested after a meeting called by the Ministry of Health that the matter should be handled by Whitley Council machinery but the profession's representatives could not agree since they were not willing to have dental decisions handled by representatives of other professions and trades. (A Whitley Council is a method of conciliation between representatives of employers and employees, and, because the dental profession is national in character, its problem would be placed before the National Whitley Council which would not provide dental representation.)

The Education Committee of the County Councils Association approved the resolutions of their educational advisory subcommittee on the subject of interim increases for dental officers in August and the increases were to date from October 1, 1947. But the order became involved in the mechanics of high finance and was blocked by a Government "White Paper" asking for no further increases in salaries. Finally in October 1948 the increases were authorized.

To return to the major issue: After failure to reach agreement at the July meeting, the three dental associations, public dental officers of the B. D. A.

and the dental officers of the Society of Medical Officers of Health confirmed the attitude of the profession toward a Whitley Council. They agreed to ask the government for an immediate conference to consider the remuneration of the public dental officers but by the time the Ministry had expressed sympathy with the request, it was found that the dispute was between the dentists and the Local Authorities and school dentists were resigning in alarming numbers. A series of meetings which included one sponsored by the B. D. A. were held, at all of which concern for the growing disintegration of the child dental health service was evidenced. Local Authorities were called upon to consider raising of school dental officers' salaries to the Spens level. The Local Authorities found themselves unable to discuss the urgency of the situation but were only able to agree to refer the statement to two bodies, the National Joint Council for Local Authorities Administrative, Professional, Technical and Clerical Services and the Chief Officers Joint Negotiating Committee. The dental profession is not represented on either body and does not recognise them as competent to negotiate the salaries of dental practitioners.

The public dental officers reversed the original stand and passed a resolution which called for the setting up of a Functional Whitley Council for national dental officers. Shortly thereafter it became plain that the Local Authorities also had changed their minds and no longer favored such a Council. Parliament took its turn on the problem on Nov. 26 without practical results. An attempt at providing another method of collective bargaining with government also failed when the Local Authorities' recommendation of the B. D. A. fee scale was rejected by the Society of Medical Officers of Health and the National Association of Local Government Officers on the basis proposed. Again the disagreement seemed to hinge on the total lack of dental representation which would exist in the final deliberations.

Establishment of a Whitley Council for the entire dental profession, as soon as possible, along the lines suggested by the B. D. A. was demanded by the pubic dental officers in a statement which said in part "that the establishment of Whitley machinery, even if agreed to, will take some time," and that "as a matter of urgency, machinery similar" to that of the Whitley Council's be instituted immediately as a kind of subcommittee which would encourage dental officers in Local Authority employ to remain at their posts. The statement added that if neither the Council nor the subcommittee "should be possible of early creation, it is earnestly requested that you convene an ad hoc Conference attended by the Local Authority Associations with the dental side represented by dentists only on the staff side, to discuss salaries and conditions as a matter of great urgency and considerable national importance."

Having adopted the principle of a Whitley Council for dentistry the B. D. A. Remuneration Committee framed the following recommendations:

"1) That the machinery should be a Dental Functional Whitley Council consisting of representatives of employing authorities on the one hand and of those members of the dental profession engaged in the General Dental Service, together with whole or part-time dental officers employed in the public dental services on the other.

"2) That such machinery would be responsible for dealing with matters which concern the dental profession such as remuneration and other conditions of service for dentists participating in the National Health Service and the Local Authority Dental Service, provided that any review of remuneration in general, as a matter of major policy, would remain a matter for direct discussion between the Ministry or authority concerned.

"3) That the decisions of such a Dental Functional Whitley Council would not need confirmation or ratification by any other body.

"4) That this Council should set up dental subcommittees to deal with different sections of the profession, such as Hospital and Specialist Services, General Practitioner Services, Local Authority Services, Scottish Services, etc. The decisions of the subcommittees would be referable only to the Dental Functional Whitley Council and would not require ratification by any other body.

"5) That the composition of the staff sides of the Dental Functional Whitley Council and its subcommittees should be determined by the dental profession itself—the composition of each subcommittee varying with the service concerned.

"6) That discussions should take place to reach agreement upon a defined list of matters which might be of common interest to the health services as a whole. It might then be agreed that matters on such a list would be referable to the General Whitley Council for the Health Services. It would, therefore, be advisable to agree to this list before any machinery was set up.

"7) That assurances must be obtained on any matter referred to arbitration the decision shall not be prejudiced by preconceived ideas based upon the remuneration and conditions of other sections of the Health Service. With this end in view, the necessity of obtaining a separate Dental Arbitration Board should be emphasized." The Local Authorities took a long time to decide about the matter of a Whitley Council but last July the Ministry got word from them that they were willing to enter a Whitley Council and an exploratory meeting was held.

Such is a brief review of the most unfortunate result of the Health Service —the collapse of the School Dental Service, and of the very slow and protracted negotiations that are trying to get justice for the public dental officer. It is only the high ideals and belief in the importance of their work that keeps the small number of school dentists in their posts. They have made great financial sacrifices to remain in the service and the whole profession regrets that the discussions are taking so long to bring a just reward to those in the school service, for until an adequate salary is paid the public dental service will not recruit the first class men and women who are required to carry on the advances that have already been made.—*John R. Boyes, Newcastle Upon Tyne, England.*

THE NATIONAL SCENE

from The Journal's Washington Correspondent

The new session of Congress opening this month, whether it passes much or little of President Truman's Fair Deal "must" legislation, can safely promise one thing—spirited action and lots of fireworks on domestic issues.

In the forefront will be compulsory health insurance. A House investigation of lobbying activities, still in a preliminary stage, will get fully under way and fur will begin to fly. Supporters of a bill establishing a United Medical Administration, merging all federal health and hospital facilities, will run into strong headwinds of opposition. The President, in all probability, will renew his attempt —beaten down last year—to get a Cabinet Department portfolio for Oscar R. Ewing, as Secretary of Welfare, thereby assuring another hot battle. Government financial assistance for medical and dental schools is still another moot issue, as is the Administration's school health services bill, the latter branded by some as an opening wedge for socialized medicine.

Only new compulsory health insurance measure promised for the next session has come from Senator Douglas (D., Ill.), who announced he would introduce a revised plan wherein the "deductible" principle used in auto and other types of accident insurance will form the foundation. Purpose of the new bill, he said, will be to relieve the individual of at least part of the burden of catastrophic illness. The tax necessary to maintain the Douglas plan amounts to half that specified in Thomas-Murray-Dingell legislation.

Announcement of the new government insurance scheme came during the meeting of American Medical Association's House of Delegates in the Capital. Major among the actions taken by this body were the assessment of $25 annual dues on members for the first time in history and establishment of a policy opposing current legislation to provide federal funds for medical, dental and other types of professional education. This latter action is in direct contrast with one taken by the A.D.A. House of Delegates last October in which they approved of federal aid to professional education provided the funds came unencumbered.

It is obvious that dentistry will be a very interested bystander at the Capitol Hill proceedings these next six or seven months. Drastic changes in dental economics, federal subsidization of dental schools, impetus to dental research, overhauling of dental administration in both the military and civilian branches of the government—all are contingent in a large degree upon forthcoming developments in Washington. It is quite possible, even probable, that compulsory health insurance and some of the other battles will be fought to no decision in 1950. Nevertheless, it will be of prime importance to watch closely the progress of these contests and the commitments of their Congressional participants in order to gain a clearer conception of what may lie ahead in 1951, after the fall elections of 1950.

Of more immediate consequence, the profession looks to the new year to bring appropriations for construction of a National Dental Research Institute building, now in the architectural planning stage; strengthening of the dental reserve corps of Army, Navy and Air Force and correction of deficiencies that have retarded growth and efficiency; and continuance of the trend, in connection with fixing of official policies, toward utilization of consultative services of American Dental Association and its leaders.

A pre-Christmas disclosure by Veterans Administration was that Russell W. Groh, dean of the University of Buffalo School of Dentistry, will become chief dental officer at the new veterans hospital in that city, effective Jan. 1. Dr. Groh has resigned his deanship but will continue his teaching as professor of operative dentistry. Elsewhere, three dental deans have been added to deans' committees serving V.A. hospitals. They are Harry Bear, of Medical College of Virginia, on the McGuire hospital committee, Richmond; R. E. Myers, of University of Louisville, on the Louisville veterans hospital committee, and Harold J. Noyes, University of Oregon, at the Portland veterans hospital.

A special five-man advisory committee concluded public hearings in mid-December on ways and means of strengthening reserve components of the military's medical and dental branches. A.D.A. representatives were heard in the final week. One of the related matters discussed, but on which there was no official statement issued, was pending legislation to place Army's dental department on same administrative level as the Navy's.

Three of the 82 students from the United Kingdom who have been selected by the Board of Foreign Scholarships for travel grants under the Fulbright Act chose to study dentistry at Northwestern University. They are Douglas Norman Allan, Geoffrey B. Elphicke and John Collen Schofield. The Fulbright Act grants cover round trip travel expenses only.

A research contract was awarded in December to University of North Carolina by U. S. Atomic Energy Commission for tracer studies and irradiation in dental metabolism. The project will be under direction of Dr. G. C. Kyker. The award brought to 160 the number of AEC-supported projects in medical, dental and biological research now being carried on at schools, hospitals and other institutions.

How A.D.A. and other national professional societies stand on key issues in health and hospital care is set forth in a transcript, published recently, of public hearings held last summer by the House Committee on Interstate and Foreign Commerce. The volume has 995 pages and contains hundreds of supporting statements and documents, as well as direct testimony presented by scores of witnesses. Only source of supply is the committee itself, since the hearings have not been placed on sale at Government Printing Office.

The Food and Drug Administration announced the appointment of Erwin E. Nelson, M.D., as its medical director to succeed Robert T. Stormont this month.

Dr. Nelson has been in charge of passing on applications to establish the safety of new drugs before they are placed on the market. Dr. Stormont is resigning to become director of the A.M.A. division of therapy and research, and secretary of the Council on Pharmacy and Chemistry.

A. D. A. AFFAIRS

A.D.A. RELIEF FUND CAMPAIGN ADVANCES AS ALABAMA DENTISTS REACH 45% OF QUOTA

For the second year in succession, dentists in Alabama jumped into the lead with contributions to the A.D.A. Relief Fund, having met 45 per cent of their state's quota by Dec. 1, the end of the first accounting period in the current 1949-50 Relief Fund drive. The Alabama contribution percentage was more than twice that of 20 per cent for the entire nation.

A total of $21,141.81 from 8,745 contributors had been received toward the Association's goal of $100,000 on Dec. 1. This amounted to an approximate average of $2.30 for each contribution. However, an additional 10,000 contributions were received between Dec. 1 and Dec. 15 and a tabulation was not available at press time. On the 15th it was estimated that about 28 per cent of the total active and life members of the A.D.A. had contributed to this year's Fund.

Tied for second place in the tabulated receipts were Iowa and North Dakota, each with 37 per cent of their respective quotas contributed. In actual contributions, New York dentists led the nation with a total of $2,505.50 (16 per cent of quota). Illinois dentists were second with a total of $2,374.85, or 31 per cent of quota.

A new appeal for generous contributions has been issued by John S. Owens, of Camden, N.J., chairman of the Council on Relief, in which it is pointed out that the number of dentists and their families applying for Relief Fund assistance is increasing.

Each contribution will be divided equally between the A.D.A. Relief Fund and the relief fund of the state dental society to which the contributor belongs. A breakdown of receipts by constituent societies follows:

	1949-50 Quotas	To Dec. 1 Contributions	Pct.
Alabama	$ 810.00	$ 365.50	45
Arizona	260.00	35.00	13
Arkansas	490.00	113.00	23
Air Force*	150.00*		
Army	360.00	64.00	18
California	3640.00	654.00	18
So. Calif.	4340.00	872.00	20
Colorado	888.00	31.00	04
Connecticut	1940.00	354.00	18
Delaware	150.00	18.00	12
D. C.	810.00	196.00	24
Florida	1180.00	267.00	23
Georgia	1020.00	264.00	26
Hawaii	360.00	62.00	17
Idaho	270.00	56.00	21
Illinois	7640.00	2374.85	31
Indiana	2340.00	660.50	28
Iowa	1910.00	708.50	37
Kansas	1130.00	363.01	32
Kentucky	1100.00	127.00	12
Louisiana	1040.00	115.00	11
Maine	420.00	74.00	18
Maryland	1040.00	272.00	26
Massachusetts	3780.00	19.00	01
Michigan	3900.00	971.00	25
Minnesota	3060.00	790.00	26
Mississippi	500.00	143.60	29
Missouri	2670.00	697.50	26
Montana	340.00	109.00	32
Navy	710.00	42.00	6
Nebraska	1160.00	45.50	4
Nevada	100.00	21.50	22

*Formerly included with Army.

New Hampshire	410.00	48.00	12
New Jersey...	4290.00	832.00	19
New Mexico..	190.00	56.00	29
New York ...	15560.00	2505.50	16
North Carolina	1190.00	208.00	17
North Dakota.	340.00	126.00	37
Ohio	4910.00	929.30	19
Oklahoma ...	920.00	194.00	21
Oregon	1150.00	189.50	17
Panama Canal	30.00	———	—
Pennsylvania .	7260.00	1465.55	20
Pub. H. Serv..	300.00	18.00	6
Puerto Rico ..	290.00	36.00	12
Rhode Island.	530.00	58.00	11
South Carolina	380.00	75.00	20
South Dakota.	350.00	54.00	15
Tennessee ...	1100.00	119.00	11
Texas	3040.00	525.00	17
Utah	470.00	14.00	3
Vermont	210.00	1.00	0.5
V. A.	980.00	82.00	8
Virginia	1120.00	180.00	16
Washington ..	1680.00	335.50	20
West Virginia.	730.00	204.00	28
Wisconsin ...	2990.00	662.50	22
Wyoming	170.00	41.00	24
TOTALS	$100,000.00	**20,141.81	20

**Includes $2450 in miscellaneous contributions

SCIENTIFIC PROGRAM FOR 1950 A.D.A. MEETING IS ADVANCED

The Council on scientific session, meeting in the A.D.A. Central Office, Dec. 17, determined that the theme of the 1950 scientific session will be "a critical evaluation of the progress made in dentistry in the last 50 years." The Council also completed nominations for 1950 section officers and established a tentative schedule for the essay program of the 91st annual session to be held Oct. 30-Nov. 2, in Atlantic City.

Final approval of the new section officers will be made by the Board of Trustees when it meets Feb. 6-7, in Chicago, according to William A. Garrett, of Atlanta, Ga., Council chairman. The essay program, he said, will occupy four half days beginning on the afternoon of the second day of the annual session and closing on the morning of the fourth day. Two joint section meetings will be held each day and the scientific motion picture program will be conducted throughout every day of the annual session.

The Council also reviewed the scientific program presented at the last annual session in October with a view to improving the 1950 meetings.

CONSTITUENT SOCIETIES URGED TO TRANSMIT 1950 A.D.A. DUES

All constituent dental society secretaries were urged last month to transmit 1950 dues to the Central Office as rapidly as possible by Holly K. Jarvis, of Cincinnati, chairman of the Council on Membership. The Council met in Chicago last month to complete plans for a continuing membership drive during the coming year. It was pointed out at the meeting that early transmittal of dues is necessary to prevent a lapse in subscription to THE JOURNAL and other Association benefits. Annual dues of $12 were due on Jan. 1.

The Council is expecting increased membership in all classifications, Dr. Jarvis said, adding that four dental schools already have reported 100 per cent of their enrollments as student members of the Association. Last year, student memberships more than doubled the previous record and contributed substantially to the Association's record high total membership of 75,267 as of Nov. 30.

The schools which have reported 100 per cent student membership enrollments are: Loyola University (Chicago) with 355 members; University of Southern California with 425 members; University of Texas with 225 members, and University of Kansas City with 407 members. As of Dec. 15, a total of 1,787 dental students had paid their 1950 dues of $3. An increase also was noted in the number of requests for membership applications from dentists in the armed forces and other government services. These dentists may join the A.D.A. directly.

It also was announced at the meeting that the Council will request the state dental societies in Alabama, Illinois, Mississippi, South Carolina and West Virginia to seek amendments to their state dental practice acts to provide mandatory registration of practicing dentists periodically. These are the only states among the 48 and the District of Columbia where periodic registration is not required.

HOUSE ACTION CLARIFIED: '50 A.D.A. DUES SAME AS IN '49

In view of the numerous inquiries being received in the A.D.A. Central Office relative to the recent action of the House of Delegates to consider increasing annual dues in the Association from $12 to $20, it was pointed out last month that 1950 dues are the same as those in 1949 —$12.

The proposed dues increase would affect all active members of the Association but it could not be made effective for 1950 unless the House of Delegates had voted unanimously for the increase which was not the case. The bylaws provide that any amendment affecting a change in dues of active members may not be acted upon at the anual session at which the proposal is introduced except by unanimous consent.

Final action on the dues proposal will be taken by the House at the 1950 meeting in Atlantic City and if approved will become effective in 1951.

J. ROY DOTY NAMED SECRETARY OF COUNCIL ON THERAPEUTICS

J. Roy Doty, Ph.D., of Chicago, has been appointed as secretary of the A.D.A. Council on Dental Therapeutics to succeed Donald A. Wallace who resigned to become assistant director of research for the Pepsodent Division of Lever Brothers Company. The appointment was announced by Harold Hillenbrand, secretary of the Association.

Dr. Doty will continue to be director of the Bureau of Chemistry, a position to which he was appointed in September, 1948. As secretary of the Council, he will be responsible for administration of the Association's program of evaluating and accepting therapeutic products related to the practice of dentistry, in addition to managing other activities of the Council.

A member of the A.D.A. Central Office staff since 1943, Dr. Doty served for several years as senior chemist in the Association's laboratory. Among other positions he has held are an assistant professorship in physiology at Louisiana State University school of medicine and an instructorship in analytical chemistry at Monmouth College. He received his Ph.D. degree from the University of Illinois in 1933 and has been a frequent contributor to such scientific publications as *Analytical Chemistry, Journal of Biological Chemistry* and the *American Journal of Physiology*. He is a member of the American Association of Biological Chemists and the American Chemical Society.

THREE A.D.A. COMMITTEES FILLED BY PRESIDENT PHILIP E. ADAMS

In accordance with action of the Board of Trustees at the recent 90th annual session, Philip E. Adams, A.D.A. president, has appointed James E. John, Roanoke, Va.; R. C. Dalgleish, Salt Lake City, and C. S. Foster, Cedar Rapids, Iowa, as a committee to survey the program of the National Board of Dental Examiners. Dr. John is chairman.

Reappointed by the President to the special committee of the Board to study the problems involved in making a survey of dentistry are: Daniel F. Lynch, chairman, Washington, D. C.; William McGill Burns, Brooklyn, and Fred S. Shandley, Seattle.

To the special committee of the Board which will survey the Association's research program, President Adams appointed Dr. Lynch and L. H. Jacob, of Peoria, Ill. Other members of the committee are J. L. T. Appleton, Philadelphia, chairman of the Council on Dental Research; Thomas J. Hill, Cleveland, chairman of the Council on Dental Therapeutics; Henry A. Swanson, Washington, D. C., chairman of the Council on Dental Museum and Registry, and Harold Hillenbrand, of Chicago, secretary of the Association.

A.D.A. COUNCILS AND BOARD OF TRUSTEES TO MEET SOON

At least ten agencies of the A.D.A. will conduct meetings within the next two months at the Central Office, including the Board of Trustees, the Association's interim policy making body.

First among the Councils to meet will be the Council on Journalism (Jan. 21), headed by Charles F. Wilkie, of Albany, N. Y. The Board will meet Feb. 6-7.

Other Councils, their chairmen and dates of their meetings are as follows: Council on Dental Education, J. Roy Blayney, Chicago, chairman, Feb. 2-3; Council on Federal Government Dental Services, Rudolph H. Friedrich, Plainfield, N.J., chairman, Feb. 4; Council on Legislation, E. Harold Gale, of Albany, N.Y., chairman, Feb. 4-5; Council on Dental Museum and Registry, Walter A. Swanson, of Washington, D.C., chairman, Feb. 6; Council on Membership Holly K. Jarvis, of Cincinnati, chairman, Feb. 6 and Council on Dental Therapeutics, Thomas J. Hill, of Cleveland, chairman, Feb. 10-11. Dates for a meeting of the Council on Dental Health, headed by Leo Schoeny, of New Orleans, have not yet been announced. The meeting of the Council on Dental Therapeutics will be held jointly with the Bureau of Chemistry.

DENTAL EDUCATION

SURVEYS OF DENTAL EDUCATION ADVANCING ON THREE FRONTS

Advances are being made in the study of dental education on at least three fronts by the A.D.A. Council on Dental Education, it was reported at year's end by Shailer Peterson, Council secretary. Results of the surveys and studies are expected to produce a comprehensive picture of the status of dental education as it relates to possible expansion of school facilities, the number of educators in the field and the relative merit of foreign dental education.

All three projects are running simultaneously, Dr. Peterson said. Among the most important is a study of dental school facilities with a view to possible expansion of existing schools and construction of new ones. Such factors as what type of installation is best suited for handling heavier student loads and what new methods are being used to handle the constantly expanding demand for admission to dental school are included in the study.

The current status of dental faculties and more particularly the areas in which a need for additional personnel exists is the subject of another study. Results of the study are expected to yield a clearer picture of the overall conditions under which dentistry is being taught. Also, Dr. Peterson said, the study should provide reliable data on the much discussed dental teacher shortage.

The scholastic achievements of foreign dental school graduates studying in this country's dental schools is the third study being conducted and it is hoped that it will help provide the information necessary to evaluate more accurately academic standards in foreign dental schools.

In addition, it was reported that the Council is assembling data for the 1949-50 Dental Students Register and prepar-

ing a list of graduate, postgraduate and refresher courses being offered by the recognized dental schools, the Army, Navy and other agencies.

EXPANDING HYGIENIST'S SCOPE SUBJECT OF EASTERN PROJECT

An attempt will be made to determine the desirability of enlarging the scope of services which may be rendered by dental hygienists through a special research project now under way under the direction of the Massachusetts Department of Public Health. Funds for the project which is being conducted at the Forsyth Dental Infirmary for Children, in Boston, are being supplied by the U.S. Children's Bureau, an agency of the Federal Security Agency.

The next five years will be devoted to the project, the first two of which will be used to train feminine personnel and the last three will be used for evaluating results. Howard M. Marjerison, a member of the infirmary staff, is in charge of the project.

An official announcement by the Massachusetts Department of Public Health said:

> "For many years the desirability of increasing the scope of the service which auxiliary aids may render in the field of dentistry has been a debatable subject. No evidence, however, has been available in the United States to suport the contentions of various groups concerning this question. In an effort to provide concrete evidence as to the advisability or inadvisability of such a program this project has been initiated. The Department and the Forsyth Dental Infirmary are approaching this experimental project with an open mind. Careful statistical analyses and all available means of obtaining objective evidence will be utilized during the course of the study in an effort to determine the quantity and quality of dental care that can be performed by auxiliary personnel so trained. A representative group of trainees will be selected from the first-year class at the Forsyth School for Dental Hygienists. As a part of their course of training, the students selected for this project will qualify as dental hygienists as presently defined under the laws of the Commonwealth."

DATES FOR DENTAL SCHOOLS ANNUAL MEETING ANNOUNCED

The American Association of Dental Schools will hold its 1950 meeting in French Lick Springs, Ind., Mar. 27-31, it has been announced. General sessions will be conducted on March 27, 28 and 29, and research meetings will be held on March 29, 30 and 31. Announcement of the program has not yet been made.

FUNDS FOR DENTAL SCHOOL SOUGHT BY NORTHWESTERN

Alumni of Northwestern University's dental school are moving into high gear for their Centennial campaign to raise funds with which to rehabilitate equipment and expand teaching and research by 1951, when the University celebrates its 100th anniversary. The preliminary dental school campaign, which began late in the spring of 1949, has already raised a total of $65,000 toward the minimum goal of $175,000.

As one phase of the University's Centennial development program to raise $8,250,000 by 1951, the dental school campaign is headed by Dale H. Snyder, of Milwaukee. Under him is a nationwide organization with 77 state and regional chairmen and a total of 589 workers, all Northwestern alumni and

practicing dentists, who will solicit the 5,000 alumni of the school.

The minimum goal of $175,000 has been set to cover the costs for rehabilitation of the dental school, including installation of new dental chairs, seats for the operators, x-ray machines and viewing boxes, microscopes, and special research equipment. In addition, it is hoped that a substantial amount for teaching, research, and fellowships will be raised.

A national committee of six members, under the direction of Dr. Snyder, heads up the activities of state and regional chairmen. Members of that group are Fred W. Gethro and George Meyer, both of Chicago; Charles H. Kendall, of Milwaukee; Charles W. Freeman, dean of Northwestern's dental school; George W. Teuscher, professor of pedodontia, and Robert E. Blackwell, professor emeritus of operative dentistry.

Dean Freeman said of the Centennial, "From the standpoint of the dental school, it will be more than a celebration. It will be a period of self analysis and constructive thinking about the future of the dental school."

Donors to the campaign may give for rehabilitation or to the general fund. In the rehabilitation program they may establish a name memorial through the purchase of equipment, for which name plates will be prepared and placed upon the equipment specified. They may also denote for general rehabilitation, teaching, fellowships, general research, or for one of the four research funds bearing the names of Black, Fosdick, Gilmer, and Lundquist.

UNIVERSITY OF TORONTO TO GIVE POSTGRADUATE COURSES

Two postgraduate courses, one in roentgenology and the other in operative dentistry will be given in February by the University of Toronto faculty of dentistry, according to Roy G. Ellis, dean.

The course in roentgenology will be conducted during the week Feb. 27-March 3 and will be devoted to study of technics and interpretation. Interpretation will be correlated with the pathology and histopathology of dental disease.

Among subjects which will make up the course in operative dentistry to be given Feb. 13-17 are a discussion of the philosophy of operative dentistry; oral diagnosis; treatment planning; rubber dam and local anesthesia for operative procedures; dental materials; cavity preparation and insertion of amalgam, silicates and inlays; occlusion, and periodontal considerations as applied to operative dentistry. For information on either course, write Dean Ellis, University of Toronto, faculty of dentistry, 230 College St., Toronto, Ontario.

NEW YORK UNIVERSITY OFFERS SIXTY POSTGRADUATE COURSES

Some 60 postgraduate courses in dentistry ranging from short refresher courses to complete preparation for certification are being offered by New York University college of dentistry, Walter H. Wright, dean of the dental school, announces.

Subjects to be covered in these courses are anatomy, ceramics, dental obturators, dentistry for children, crown and bridge, dental care in public health, dental jurisprudence, dental prosthesis and research, complete dentures, immediate dentures, inhalation anesthesia, operative dentistry, oral surgery and surgical anatomy, partial dentures, pathology, periodontia, practice management, precision attachments, pulp canal therapy, roentgenology, and orthodontics.

One and two year postgraduate courses in periodontia leading to a "Certificate of Proficiency" can be arranged for speci-

ally qualified students, Dean Wright said. Additional information may be obtained from New York University college of dentistry, postgraduate division, 209 E. 23rd St., New York 10.

SOUTHERN CALIFORNIA APPOINTS NEW PROFESSOR OF PROSTHETICS

Frank Lott, former chief dental officer of the Canadian Army and University of Toronto dental school professor, has been appointed professor and head of the department of prosthetics at the University of Southern California dental school, according to John C. Brauer, dean.

Dr. Lott, who was a brigadier general during the war, is credited with having written the master plan for the Canadian Army Dental Corps during the last war. Prior to military service he served as professor and head of the department of prosthetics at Toronto. Immediately before he joined the staff at Southern California he was director of research for Dental Supply Co., of New York.

DENTAL SOCIETIES

Viewing a Veterans Administration exhibit at the Greater New York meeting, held in December, are: (L. to R.) Rear Admiral Robert Davis, of the Navy Dental Corps; William McGill Burns, of Brooklyn, an A.D.A. trustee; Philip E. Adams, of Boston, A.D.A. president; Percy T. Phillips, New York, speaker of the A.D.A. House of Delegates; Gerald G. Burns, of Rochester, N. Y., third vice-president of the Association, and Captain R. W. Malone, also of the Navy Dental Corps. An estimated 15,000 persons attended the meeting sponsored by the First and Second District Dental Societies of the Dental Society of the State of New York.

AMERICAN COLLEGE OF DENTISTS TO LOAN WIRE RECORDED ESSAYS

The American College of Dentists will loan a number of wire recordings of papers delivered at its annual meeting in San Francisco, last October, to dental groups, according to Otto W. Brandhorst, of St. Louis, secretary of the organization.

Some of the recordings are suitable for use at service club and P-T-A group meetings, it was stated. They can be reproduced on any standard wire recorder. Requests for the recordings should be sent to Dr. Brandhorst, secretary of the American College of Dentists, 4952 Maryland Ave., St. Louis 8.

A.A.A.S. HAS ONE-HUNDRED DENTAL SUBSECTION FELLOWS

One hundred of the 495 members of the subsection on dentistry of the American Association for the Advancement of Science have been elected as Fellows, according to Isaac Schour, of Chicago, secretary of the subsection.

A meeting of the subsection was to be held Dec. 30, in New York, and discussion of recent advances in cytochemistry and biochemistry and stages of growth and devolopment was scheduled. Nominations also were to be received for the position of secretary of the subsection.

ORAL PATHOLOGISTS TO HEAR LEONARD SCHEELE IN CHICAGO

Forward trends in dental research will be the topic on which Leonard A. Scheele, U.S. Public Health Service surgeon general, will speak at the concluding meeting of the American Academy of Oral Pathology's annual session, Feb. 5, in Chicago.

Both the scientific program, to be held during the day, and the dinner at which Dr. Scheele will speak, are open to all interested persons, according to Hamilton B. G. Robinson, of Columbus, Ohio. For dinner reservations write Dr. Robinson, Ohio State University college of dentistry, Columbus 10.

ARMED FORCES

A.D.A. RECOMMENDATIONS ON RESERVE OFFICERS DENTAL CORPS PRESENTED TO DEFENSE DEPARTMENT

Improved efficiency of the reserve officers dental corps in the armed forces was the subject of a series of recommendations made to a special task force of the Medical Advisory Committee of the Department of Defense by the A.D.A. at a meeting in Washington, D.C. early last month. Major among the issues discussed were planning and management, morale and a training program for reserve dental officers.

In an official statement, R. H. Friedrich, of Plainfield, N. J., chairman of the Council on Federal Government Dental Services, urged that the dental corps be operated to provide maximum efficiency in utilizing dental personnel during war so that a "suitable balance" may be maintained between civilian and military activity.

"The A.D.A. believes that the most efficient administrative pattern for health services is one in which all health activities are coordinated into a department of health at the highest possible executive level," the statement said, adding that

"the administration and planning can be most efficiently directed by the individual profession concerned." The existence of a "general lack of training" in administration of health services for dental and medical officers was pointed out. "As a result, officers have attained positions of administrative authority and rank mainly through seniority and with little or no sound schooling in administrative problems," it was stated with the admonition that "this statement should not be construed as a demand by professional personnel for administrative prerogatives at all levels. On the contrary, the Association is aware of a need for increasing the number of professional persons who are not actively engaged in their professional work while serving in the armed services."

Morale Discussed

Dealing with morale factors in the reserve dental corps, the statement urged that particular attention be paid to them and that serious consideration be given to the experiences of dentists in peacetime and during the war.

"The dentists of the regular armed services and those of the civilian component must be brought closer together since their basic objective is the same: to render competent dental service to patients," the statement said. "The time-honored doctrine of the Medical Department that a professional person is 'an officer first and a doctor, second' must be discarded in favor of a doctrine which holds that a professional person is a 'health officer, first, last, and all of the time.'" It also was pointed out that "there is considerable evidence that the professions have not displayed unusual enthusiasm in seeking peacetime service . . . An increase in pay, a bonus while on active duty and a retirement program have not been wholly effective in increasing the interest of professional personnel in peacetime service."

The A.D.A. statement recommended further that an effective training program for reserve corps be placed in operation.

In part, the statement said: "In the past year, the Council on Federal Government Dental Services has found that the only apparent constant factor in the (reserve) program is the constant variation between the services and between different areas of the same service program. It would seem that here is a definite need for the development of training standards.

Training Program Needed

"The Association believes that a strong program of graduate, postgraduate or refresher courses in dental subjects should be offered during the summer months in place of the usual two week period of camp training. This would attract a larger number of dentists to the reserve corps and would also serve to hold dental reserve officers who might otherwise lose their interest."

Witnesses Heard

Among the witnesses heard by the commission headed by William S. Middleton, M.D., were Philip E. Adams, of Boston, A.D.A. president; Daniel F. Lynch, of Washington, D.C., a trustee of the Association; C. Raymond Wells, of Brooklyn, a past-president of the A.D.A.; George C. Paffenbarger, A.D.A. fellow at the National Bureau of Standards in Washington; Gen. Louis H. Renfrow, a military aide to President Truman, and the heads of the Army, Air Force and Navy dental corps.

Dr. Friedrich also conferred with Richard L. Meiling, M.D., director of medical services for the Department of Defense, in connection with implementation of a policy adopted by the A.D.A. House of Delegates last October calling for legislation under which the dental corps would function independently in a department of health coordinated by the surgeon general.

NAVY HAS PART TIME POSTS FOR RESERVE DENTAL OFFICERS

Openings for Navy reserve dental officers in "some" Naval Districts is reported by the Bureau of Medicine and Surgery.

The Navy release says "appropriate duty" with pay is available at naval training centers on a part time basis. Primary duties involved in the positions are conducting dental examinations and maintaining reserve dental records.

Reserve dental officers living in the vicinity of a navy training center may contact the commanding officer for further information.

VETERANS

STATUS OF V. A. DENTAL CHIEF DEFINED IN NEW STATEMENT

Pending issuance of a review and revision of Veterans Administration regulations outlining the Authority of the Assistant Medical Director for Dental Service, the position now occupied by Bion R. East, Chief Medical Director Paul B. Magnuson has issued the following statement of policy:

"1. The Assistant Medical Director for Dental Service is directly responsible to the Chief Medical Director in all matters pertaining to the Dental Service and will be his representative on all dental matters.

"2. Chief Dental Officers of field stations are directly responsible to the Assistant Medical Director for Dental Service through the Managers of their respective installations.

"3. The Assistant Medical Director for Dental Service, subject to final approval by the Chief Medical director, will have authority to make decisions in matters concerning the Dental Service to the full extent of the existing law. All matters that affect or relate to the Dental Service in the Department of Medicine and Surgery will be authorized only on the approval or understanding of the Assistant Medical Director for Dental Service. At VA installations, the Chief Dental Officer will exercise comparable authority and responsibility through the Manager in such of these matters as are applicable in the field."

PUBLIC HEALTH

CUBA TO RECEIVE FLEET OF TEN MOBILE HEALTH CLINICS

A fleet of ten "health clinics on wheels" for the Cuban government which include a completely equipped dental surgery were to be delivered late last month, according to a release by Westinghouse Electric Corporation. The units represent the first step in a rural health program personally sponsored by President Carlos Prio Socarras, it was stated.

The full program calls for a number of health caravans, each consisting of a medical-dental clinic, an ambulance, and a coach containing living quarters for a six-member team of physicians, dentists and technicians, the release said, adding that the units will be the "most elaborate" ever built.

Designed to bring modern health services, in many cases for the first time, to some 100,000 children of the "poorer" rural classes, the program is unique in that it is financed with funds from Cuba's national lottery.

INTEREST IN CHILDREN'S DENTAL HEALTH DAY IS INCREASING

There will be a considerable increase in the number of communities throughout the country observing national Children's Dental Health Day on Feb. 6,

reports being received from constituent and component dental societies indicate.

Special material to aid state and local committees which includes posters, pamphlets, speeches, news releases, newspaper feature articles, radio scripts and suggestions for community programs were to be distributed by the A.D.A. Central Office late in December.

Programs similar to that conducted by the Cleveland Dental Society, originator of Children's Dental Health Day, will be held by many state and local dental societies. Generally the programs will be arranged so that special dental health education events will be presented for the laity and a scientific dental meeting devoted to childen's dentistry will be conducted for the profession.

In addition, efforts will be made by the A.D.A. to get final enactment of a bill in Congress (H.J. Res. 184) which directs the President to proclaim Feb. 6 as national Children's Dental Health Day. The measure has been passed by the House of Representatives.

GENERAL NEWS

TWO CHANGES EFFECTED IN A.D.A. AD AND EXHIBIT STANDARDS

In view of the fact that two changes have been made in the official Advertising and Exhibit Standards of the Association, THE JOURNAL herewith publishes the revised version in its entirety. In part ("c") below the wording has been changed to delete reference to "materials which are presently the subject of formal complaint by the Federal Trade Commission," and in the paragraph numbered "four" the change places responsibility on the Editor and Business Manager for determining eligibility of pharmaceutical products not considered for acceptance by the Council on Therapeutics.

For the purpose of determining eligibility of products and services for sales promotion through official media of the American Dental Association, i.e., advertising and exhibits, the following set of standards has been adopted:

Any product will be accepted for advertising or exhibit provided that—

(a) it is not considered to be deleterious to the public health;
(b) it does not contain any substance that is harmful or which can be shown to be potentially harmful by substantial scientific evidence;
(c) there are no claims presented which have been the subject of unfavorable decision by the Federal Trade Commission;
(d) any claims made in lay and professional publications and exhibits are consistent with those presented in media of the American Dental Association;
(e) the advertising and sales promotion conform to those policies of the Association which relate to the maintenance of professional standards and the employment of equitable methods of sales promotion;
(f) the terms, Doctor or Dentist, or dental degrees, are not used with reference to or as designation for the product or in connection with the firm name.

In addition to the foregoing general stipulations, the following specific requirements are established to cover the several categories of products offered to the dental profession:

1. **Therapeutic Agents**—Except as otherwise provided, products coming within the scope of the Council on Dental Therapeutics of the American Dental Associa-

tion must be acceptable to the Council.

2. **Cleansing Dentifrices**—(Definition: A cleansing dentifrice is defined as one which aids in cleansing the teeth, and for which no therapeutic claims are made.) There must be no change in the qualitative formula unless previous notice is given.

3. **Non-Therapeutic and Cleansing Mouth Washes**— (Definition: A non-therapeutic and cleansing mouth wash is defined as one which aids in cleansing the mouth and for which no therapeutic claims are made.)

4. **Pharmaceutical Products**—Miscellaneous pharmaceutical products which are not considered for acceptance by the Council on Dental Therapeutics will be eligible, if evidence satisfactory to the Editor and Business Manager is presented that they have a distinct dental application.

5. **Toothbrushes**—The claims and products made must be satisfactory to the Editor and Business Manager of the American Dental Association.

6. **Foods**—(a) A food must be acceptable to the Council on Foods and Nutrition of the American Medical Association, and the advertising claims must be acceptable to the Editor and the Business Manager of the American Dental Association; or

   (b) The advertising claims must be acceptable to the Council on Foods and Nutrition of the American Medical Association and to the Editor and the Business Manager of the American Dental Association; or

   (c) When a food is not considered for acceptance by any agency of the American Dental Association or American Medical Association, the claims must be acceptable to the Editor and the Business Manager of the American Dental Association.

7. **Dental Materials**—Dental materials must not have been adjudged worthless or dangerous by official reports of the Council on Dental Research of the American Dental Association.

FEDERAL TRADE COMMISSION RESTRAINS IPANA ADVERTISING

An order directing Bristol-Myers to discontinue advertisements claiming certain therapeutic values for its Ipana toothpaste has been issued by the Federal Trade Commission. The order will be appealed.

In particular, the Commision orderd the firm to cease advertising that Ipana with massage will prevent "pink tooth brush" or aid in the treatment of its causes; that Ipana has any significant therapeutic value in the treatment of mouth, tooth or gum diseases; or that massage with Ipana stimulates circulation in the gums; imparts firmness or health to the gums or prevents gum trouble.

Also attacked in the order were claims that twice as many dentists in the U. S. personally use Ipana than any other dentifrice and that more dentists recommend Ipana to their patients than any other two dentifrices combined. A corporation survey which was used as a testimonial to Ipana's popularity among dentists was cited by the Commission as being "from a restricted list of dentists, not representative of the dental profession as a whole, comprising replies from less than 2,000 of the nation's 66,000 dentists." Discrepancies of a nature as to make the tabulation "wholly unreliable"

also were pointed out by F.T.C.

Lee H. Bristol, president of Bristol-Myers, in announcing that the order would be appealed said: "It is inconceivable to us that the members of the F.T.C. should have reached their decision on the basis of a full consideration of the evidence introduced at the trial . . . We welcome this opportunity—the first we have had since the complaint was issued in 1942—to place the evidence before a court of law."

NEW FILMS ON DENTISTRY FOR PROFESSION, LAITY APPEAR

Two new motion pictures on dentistry, one for use in dental health education and the other for use by the dental and affiliated professions, were released late in 1949.

The first of the two to be announced was a film titled "Dental Health—How and Why," produced by Coronet Films, of Chicago. It is designed for use by civic and social groups as well as in classroom lectures and explains the function, construction and care of teeth.

Allen O. Gruebbel, secretary of the A.D.A. Council on Dental Health, said inquiries on rental of the film, which is available in both color and black and white, are being received by his office. Coronet, he added, will sell the black and white copies for $45 and color copies for $90.

The motion picture titled "Denture Resin" is the most recent technical film prepared for the dental and allied professions by the National Bureau of Stanards under joint auspices of the Bureau and the A.D.A. Council on Dental Research.

A release from the Bureau states that "Denture Resin" shows the effect of impurities, pressure, temperature, rate of curing, duration of curing, mold surfaces, and water content on the dimensional accuracy and stability of dentures made from acrylic resins. Denture processing technics, based on data obtained on these factors at the Bureau, is demonstrated. This 16 mm. sound film has a running time of 18 minutes.

Copies of "Denture Resin" and the other films on dentistry prepared at the Bureau are available for loan on request and copies may be purchased for the cost of reproduction. It also was pointed out by the Bureau that loan requests should be made at least six weeks in advance of a projected showing.

Two Navy dental training films, prepared under direction of the Navy Dental Corps by the Bureau of Aeronautics, became prominent at year's end when the Venice Film Festival announced its choice of outstanding films. A motion picture titled "Endodontia" was awarded first prize and one titled "Periodontia" received honorable mention in the "medical films—medical natural sciences" division. The festival is an international competition of cultural and scientific motion pictures held under auspices of the Italian government. Awards are based on excellence of quality and imaginative treatment of the film submitted.

INDEXES FOR TWO A.D.A. PUBLICATIONS AVAILABLE

The semiannual index to THE JOURNAL and the annual index to the *Journal of Oral Surgery* may be ordered this month. Requests for these indexes should be placed with the Order Department, American Dental Association, 222 E. Superior St., Chicago 11.

BLUE CROSS ENROLLMENTS REACH THIRTY-FIVE MILLION

More than 35,000,000 persons were enrolled in non-profit Blue Cross hospital care plans on Sept. 30, 1949, the Blue Cross Commission of the American

Hospital Association, coordinating agency for the 90 Blue Cross plans in the U.S. and Canada, reported recently.

It was stated by Blue Cross that 22.11 per cent of the total population of 47 states and the District of Columbia, and 22.9 per cent of the combined population of the seven Canadian provinces served by Blue Cross are enrolled in the plan.

MARYLAND RECRUITING DENTISTS FOR STATE MENTAL HOSPITALS

The Baltimore Department of State Employment and Registration is attempting to recruit dentists to serve in state mental hospitals, according to Russell S. Davis, state employment commissioner. Dental Hygienists and dental interns also are being recruited, he said.

Salary scales for the various positions are as follows: dentist, $4,658 to $5,823; dental intern, $1,500 to $1,875, and dental hygienist, $2,517 to $3,147. Information is available from the state employment commissioner, 31 Light St., Baltimore 2.

JOURNAL TO FEATURE FIFTY YEARS OF DENTAL PROGRESS

A special midcentury issue of THE JOURNAL is being planned to present the high points in dentistry's progress during the first 50 years of the twentieth century, according to Lon W. Morrey, editor.

Distinguished authorities in all fields of dentistry are being consulted in preparation of the issue which is expected to appear in late spring or early summer. The articles to be published will deal largely with the scientific advancements and trends during the first half of the century.

▲

Security.—When government takes income from the individual, it is taxing away the source from which real personal security can be provided. The more government absorbs, the less remains in the hands of the citizen to provide for his personal wishes, desires, and needs. Ultimately the government usurps the function of providing security by taking private income in exchange for doles of bread and butter. The end of this is slavery. And the degree to which we are approaching this is terrifying, if we will only sit down and think about the figures.—*Raymond Moley, "Illusions of Security," Newsweek, August 29, 1949, p. 76.*

THE READER COMMENTS

ON DENTISTRY AND HUMOR

I have always been personally proud of the profession of dentistry and proud also of the A.D.A. and all of its accomplishments. I have no criticism to offer but I do have this suggestion. I have been incensed many times at the usage of dentistry in cartoons and motion pictures and have talked about it to many of our dentists at various times and places with agreement as to "something should be done about it"—but, nothing is done. To be specific, I saw the motion picture, "Son of Rusty," which was a very well put together story and very entertaining but had a scene using dentistry in a very unfavorable light. It added nothing to the plot and therefore was inexcusable. Those of us in general practice who believe in children's dentistry (and who doesn't honestly feel that children's dentistry is the most important phase of dentistry?) realize that such an unfavorable usage of the profession destroys, in a matter of minutes, all the effort of our diligent teaching of parents and children.

I am quite sure that if the honorable society of dentists were to present in an honest and sincere manner the true perspective of the importance of dentistry a decided change would result. No longer would the profession be portrayed as a cross between a moronic and a sadistic cult.—*C. R. Hensing, Des Moines.*

ON HEALTH IN JAPAN

The Japanese are fast rebuilding their cities. While they are battling a terrific inflation in their currency, they keep steadily at work and their complacency seems to be unruffled. They cooperate with our occupation forces almost 100 per cent. They follow their Emperor's order of cooperation with our army as doggedly as they fought us several years ago.

One thing I found it hard to believe was how healthy the Japanese people appear to be. Most of the adults are husky and rugged. The children from babyhood to adolescence have fat, chubby bodies, and their cheeks are pink with color. It may be their diet, or just their rugged endurance. The Japanese farm the small arable portion of these islands with intensity. They grow lots of rice, green cabbage-like plants, onions and turnips. Their protein diet is mainly fish, which they seem to prefer raw or smoked.

The Japanese don't seem to mind the cold weather too much. Their homes are unheated, as are their street cars and their stores. They don't seem to dress very warmly, and often pad around the streets on their clogs, minus stockings.

I might add that THE JOURNAL is particularly necessary over here because it keeps us in touch with advances in the profession. — *Maj. Martin H. Waters, D.C., Osaka, Japan.*

BOOK REVIEWS

Public Health Statistics. By Marguerite F. Hall, M.A., Ph.D. Second edition, revised. 441 pages, with 41 figures and 68 tables. Index. Price $7.50. New York: Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1949.

Books on statistical theory abound, while those on practical aspects of the subject are relatively few. Most books ignore statistics as simply "numerically stated facts," and deal wholly with method, sometimes backed up by rigorous mathematical proof, sometimes presented as rule-of-thumb, and other times between these two extremes. This book emphasizes statistics as numerically stated facts in the field of public health work but also presents a working explanation of elementary statistical method. As such it will be invaluable for physicians, dentists and others, whose work involves applied statistics and for whom mastery of statistical theory would require too much time away from their profession. In fact, the copious use of statistics by opponents and proponents of compulsory health insurance makes this book an asset to anyone who wishes to be able to discuss the subject intelligently.

A term familiar to biometricians, "Standard Millions," is defined as the age distribution of a population, scaled to a million people, which has not been made abnormal by such factors as immigration and emigration. Another technical term explained is the "cohort concept." A cohort is a group of persons who begin life in the same year or decade. At any time the total number of survivors of the original group, or number of deaths from a given disease, may be computed, making the cohort a medium for expression of death rates.

Some of the other subjects treated which, because they are seldom found in books, are particularly worth while, include: census procedures and the estimating of populations; the construction of a life table; the collection of vital facts and sources of error in such data, and steps being taken to promote accuracy and completeness in public health records. Some of the untechnical statistical topics discussed are: tabular and graphic presentation; the handling of mass data, and general principles of computation. The following technical statistical methods are presented: three measures of central tendency, the median, mean and mode; measures of absolute and relative variability; Pearson product-moment correlation and other measures of relationship; trend; theory of probability and the normal curve, and measures of reliability.

Dr. Hall, contrary to common practice, makes no distinction between counting and measurement. On page 25, discussing the definition of statistics as numerically stated facts, she says: "The data must have been measured." In a footnote on page 365, she states: "The only true measurement in public-health statistics is the census, and that is made official through the law." To distinguish between measurement and counting would seem to be more useful and more correct.

The book is, to its advantage, replete with tables and charts. A few minor discrepancies have crept in, such as the statement on page 64 that the *dependent* (instead of *independent*) variable is always represented on the horizontal axis, and an inaccurate statement about percentages on the middle of page 120. Considered as a whole, the book is an excellent one for anyone whose work or interest in any way involves health statistics.—*B. Duane Moen.*

Annual Report of the Federal Security Agency, 1948, Public Health Service. 203 pages. Price 45 cents. Washington: United States Government Printing Office, 1949.

One can get a fairly accurate concept of the number and magnitude of the operations of the Public Health Service simply by knowing that only one year of these operations requires 203 pages of laconic narrative and fact-packed tables to tell the story. In this report there is a minimum of speculating and opinionating. In fact, the reader often wishes that more had been said, i.e., investigations are reported but results omitted, and an important activity, such as the establishment of a dental-assistant school, may be covered in one short sentence. The type of reporting herein which is perhaps least necessary is the occasional reference to projects and studies which are as yet inconclusive and which are continuing. The reader, at least the skeptical one, wonders whether

anything ever comes of the majority of these "continuing studies," or whether these statements are inserted as a "sop to a satrap."

Dental activities are a major part of the program of the Public Health Service. Clinical activities included giving 130,732 individual applicants a total of 737,688 treatments, covering the gamut from roentgenographs to dentures. With a $1,000,000 appropriation, the demonstration program for topical application of sodium fluoride was begun. "The purpose of the program is to demonstrate the technic of application to dentists and dental hygienists engaged in private practice, to provide a training base for dentists and dental hygienists employed by local and state health agencies, and to promote the establishment of community programs by supplying appropriate informational and consultative services together with accessible working models of a local program."

A series of field studies conducted in Miami County, Ohio, gave confirmation of the clinical effectiveness of the present topical fluoride technic. Experiments were continued in both fluorination and defluorination of public water supplies. In two cities data were being collected on the amount and type of dental service, equipment, and personnel required for adequate dental care of a community's school-age population. The National Institutes of Health carried on both laboratory experiments and field studies in matters relating to dental health.

The activities of the Public Health Service are too numerous for listing, but in general, in addition to dental activities, they are sanitary engineering activities, public medical services, medical research, and international health relations.—*B. D. Moen.*

Experimental Immunochemistry. By Elvin A. Kabat, Ph.D. and Manfred M. Mayer, Ph.D. 575 pages, with 80 figures and 80 tables. Index. Price $8.75. Springfield: Charles C. Thomas, 1948.

As the title indicates, this book deals with the use of immunochemical methods in the experimental laboratory and not with serodiagnostic procedures or clinical methods for the development of immunity to disease.

Part one provides a general consideration of the terminology, principles and methods of immunochemistry. Part two describes some of the specific uses of immunochemical methods. Chapter eight of this section will be especially interesting to biochemists, bacteriologists and other investigators in the biological field who are concerned with the isolation of proteins or carbohydrates or substances associated with these classes of materials. In part three are found brief discussions of various physical technics and microanalytical procedures frequently employed by the "immunochemist." Methods of preparing a number of proteins, protein derivatives and polysaccharides are described in part four. An appendix contains further practical information which should be useful to the less experienced worker.

The wide experience of the authors should be adequate assurance of the reliability of their exposition of the immunochemical methods of parts one and two, but it is the opinion of this reviewer that several chapters in part three fall below the high quality maintained in other sections of the book. The chemical procedures which are described are useful but perhaps not the best available in all cases. Chapter 24, "Estimation of Enzyme Activity," is limited to a short discussion of reaction rates in enzyme systems. This chapter would be more useful if it were more comprehensive or at least contained reference citations to more comprehensive reviews.

Many investigators working in related fields will find this a very valuable book because it will suggest additional methods of attack for their problems and because it will provide them with a clearer understanding of much published material referring to the use of immunochemical technics.

Adolescence Problems. By William S. Sadler. 466 pages. Price $4.75. St. Louis: C. V. Mosby Company, 1948.

The author of this book, which is a "handbook" intended for physicians, parents and teachers, is a physician and also a Fellow of the American Psychiatric Association. The purpose of this book is to provide a reader with a source book of information and help him understand the answers to many of the more commonly occurring problems of the adolescents. The book is divided into six parts, the titles of which are as follows: "Psychological and Emotional Life," "Home and Family Life," "Education and Schools," "Social and Economical Adjustments," "Sex Problems and

[illegible] Adjustments," "Admiralties of Adolescents."

This book is written in an interesting fashion and can be read easily and rapidly. It is written with somewhat of the text book approach and yet its coverage of the great many problems and situations makes it necessary for the author to treat each problem concisely. It presents to the reader one of the easiest digests of this subject which is available for those who are not students of the problem.—*Shailer Peterson.*

Education for Professional Responsibilities, A Report of the Proceedings of the Inter-Professions Conference on Education for Professional Responsibilities. 207 pages (no price indicated). Pittsburgh: Carnegie Press, 1948.

This is a report of the papers that were read at "Inter-Professions Conference on Education for Professional Responsibilities" which was held at Buckhill Falls, Pa., for the interchange of experience and ideas by teachers in the schools of divinity, medicine, law, engineering and business. This conference was conducted through the financial aid of the Carnegie Corporation in New York and to it were invited one hundred representatives from the professions indicated above. The three areas which were under discussion were: the objectives of professional education, content and method in professional education, and social and humanistic aspects of professional education. A total of eighteen papers were presented and the report also contains a bibliography on professional education in those fields which were represented.—*Shailer Peterson.*

Outwitting Your Years. By Clarence W. Lieb, M.D. Second printing. 278 pages. Index. Price $2.75. New York: Prentice-Hall, Inc., 1949.

Although the author appears at times to become perhaps a bit too dreamy-eyed, nevertheless his presentation of the case for "growing old gracefully" (incidentally the title of one chapter) is sound and encouraging. Certainly his cheerful optimism, with scientifically-backed but popularly-phrased analyses of the situation makes the book read easily.

Among especially stimulating and challenging chapters may be mentioned "Who Wants to Be Young?" "Why Retire?" "Everyone to His Hobby," and "Stop, Look Listen." Excellent advice is contained in a chapter on exercise as well as those on overeating and reducing. Lieb also does a good job of rationalizing the sex problems of the aging and his chapter on hormone treatments is especially noteworthy.

Again and again throughout the book Lieb emphasizes that, though there are helpful medical measures available to smooth the way, nevertheless in the final analysis proper adjustment to aging is an individual responsibility. Primarily an attitude of mind, this can be achieved in most persons without resorting to anything nearer psychiatry than good common sense. It is refreshing to note a complete absence of any recommendations that a "welfare state" be depended upon to solve the problems of aging.—*Wm. W. Bolton.*

Office Management for Health Workers. By Frances King and Louis L. Feldman. 164 pages. Price $2.25. New York: The Commonwealth Fund, 1949.

The training of public health workers has long been characterized by insufficient emphasis on the principles of office management. With the broadening of modern public health practice, many agencies are now seriously hampered by retaining hopelessly complex records and cumbersome office procedures. That an appropriate reference text for the health administrator is urgently needed can hardly be gainsaid. The present volume, however, falls considerably short of satisfying this need.

An obvious weakness of the text lies in its superficial treatment of records. The reader will find little to suggest the importance of "family records," a method widely adopted by health departments. The topic of surveys is airily dismissed with a shallow discussion, difficult for the reader to accept in the light of its importance.

The authors show little discrimination in compiling a list of statistics references. There is no justification for citing texts published circa 1923 and 1925 and excluding superior books of recent publication. Nor is it clear why the authors should have omitted the Marchant calculator from the equipment list.

This book is of limited usefulness for instruction of health department personnel. It is to be hoped that subsequent editions will remedy the many deficiencies.—*Samuel Herman.*

The Neocortex of Macaca Mulatta. By Gerhardt von Bonin and Percival Bailey. 163 pages. Price $4. Urbana, Ill.: University of Illinois Press, 1947.

Neuroanatomists, neurologists and mathematicians have in the last years succeeded in lifting a corner of the veil that hides the mechanism of cortical function, the basis of human thinking. It is not now the localization of distinct functions to distinct areas of the cerebral cortex—motor area, somesthetic, visual, auditory areas, and so forth—but the interaction of the different cortical fields, their dominance or interdependence, that are the most interesting and most promising research problems. Experimental work in this field, for instance on monkeys, is essential for the solution of these problems, though results can not simply be applied for the human brain. One of the most important conditions, however, for the correct interpretation of the animal experiment is the minute knowledge of the structure of the cerebral cortex, that is of the number, distribution and type of nerve cells in the six traditional layers of the cortex.

The cytoarchitecture of the human brain has been and is still being investigated. Bonin and Bailey, both eminently prepared for such a work, have now reexamined the cell structure of a macaque monkey, macaca mulatta. They have succeeded in establishing a map of the brain cortex in this animal, which will be the indispensable basis for all future experimental research. Their report contains information on cerebral growth, pattern of fissures and finally a description of the architectural types of the cortex. Sixty-two plates from microphotographs of selected sections, 40 diagrammatic drawings and finally a colored table summarizing the results as a map of the macaque brain, give clarity and documentary evidence to the descriptions in the text.—*Harry Sicher, M.D.*

Molding and Casting. By Carl Dame Clarke, Ph.D. Second edition. Index. 306 pages with 99 illustrations. Price $6.50. Maryland: The Standard Arts Press.

The author, Carl Dame Clarke, is no novice in the field of molding and casting. The first edition of this book was published in 1938 and at that time it was regarded as the outstanding publication in this field by the leading sculptors, artists, physicians, dentists and others interested in the art of molding and casting. This second edition incorporates all the more recent developments. It can be highly recommended to all.

The book is profusely illustrated and gives the step-by-step procedure involved in the various molding and casting technics. The pictures are clear and with their explanations lead to a ready understanding of the technic described. In addition, the author gives many formulas which heretofore were treated as trade secrets and indicates where and how the ingredients may be purchased.

While the book is not primarily written for dentists, a perusal of its contents gives many practical suggestions which are valuable in dental laboratory procedures and are also valuable to those dentists who are interested in experimental work. The chapter on the history of molding and casting as applied to science in general reflects the artistic and cultural background of the author and is extremely interesting. It gives the average reader, in a nut shell, a story of the development of sculpture from the cave man of the stone age to the present.—*Stanley D. Tylman.*

These Are Your Children. By Gladys Gardner Jenkins, M.A.; Helen Shacter, Ph.D., and William W. Bauer, M.D. 192 pages with 200 photographs. Index. Price $3.50. Chicago: Scott, Foresman and Company, 1949.

This is a book of interest to anyone concerned with our future generation, addressed principally to parents, about their children. It is richly illustrated and presents in easily readable form a helpful, chatty, optimistic and commonsense approach to child care, training and development.

As a chapter is devoted to each age group from the five year old to adolescence, this book serves as a guide to parents, enabling them to anticipate the changes they may normally expect in their children at any given age—changes in their interests and hobbies, as well as in physical and mental growth. It includes a sensible, natural approach to sex education, of special help to parents.

The three authors, all parents as well as authorities on child development, have included a comprehensive bibliography listing the best available articles, pamphlets, and books written by other authorities on this subject.

Medical Photography—Radiographic and Clinical. By T. A. Longmore, Hon. F.S.R. Fourth edition. 1008 pages, with 320 diagram illustrations, and 120 plates. Formulary, glossary, bibliography, and index. Price $15. New York: Pitman Publishing Co., 1949.

The first third of this book deals with fundamental principles of general roentgenography while the remaining two-thirds presents the subject of clinical photography with the exception of the final chapter. In this, the author describes the special roentgenographic technics of fluorography, tomography, seriescopy, kymography and stereoscopy closing with sections on photomicrography, macrophotography, electrocardiography and medical motion picture photography.

In the chapters on roentgenography there is a wealth of information for the general roentgenologist, the teacher of roentgenology, the x-ray technician (both beginner and veteran) and the x-ray physicist. A thorough treatment of basic fundamentals, the explanation of roentgenographic phenomena, and a description of the functions of the physical equipment used in general roentgenography leaves no doubt in the reader's mind as to the author's extensive knowledge of his subject and his ability to present sometimes confusing theory in a practical and readily understandable manner.

Innumerable line drawings demonstrating phenomena, equipment, and accessories, together with charts and graphs are helpful for a clearer concept of the text. In addition, there are plates of excellent quality. Portions giving causes of error and their remedies are of practical value and even though no specific technics are presented, the roentgenographic section is quite complete in the subject matter presented.

Until recently medical photographers had no literature which dealt specifically with their particular problems. With the ever increasing awareness of the importance of photography in medicine, this book is a welcome addition to the sparse literature on the subject.

Medical Photography is a most valuable handbook for anyone using photography as a tool in the health sciences. It describes materials, methods and technics in a simple understandable way. Of particular interest and importance are the sections dealing with aids and improvizations and the problem of standardization of medical photographs. It is very important in repeat photographs of a particular part of the anatomy that methods be used which will insure exact duplication of scale of reduction, angle and position of camera and lights. These methods are clearly presented.

Some of the more common aspects of dental photography are discussed along with specific processing procedures for both black and white as well as color film.—*William J. Updegrave* and *Alex Mucha.*

Oral and Dental Diagnosis. By Kurt H. Thoma, D.M.D., F.D.S.R.C.S. Eng. Third edition. Illustrated. Index. Price $9.50. Philadelphia: W. B. Saunders Company, 1949.

The interrelationship which exists between oral and systemic disease is being increasingly emphasized in the more enlightened practice of dentistry. It is likely that oral tissue shows a far wider range of pathologic changes than does any other. There is clearly a need for a book which deals with this subject, and yet it is not an easy assignment to arrange in a book of 537 pages an oral diagnosis and treatment guide which is sufficiently inclusive.

As has been true in earlier editions of this book, the first part deals with clinical and laboratory procedures used by the oral diagnostician. The value of a well prepared case history is stressed, and directions for obtaining one are given in detail. Laboratory and clinical procedures which are pertinent are thoroughly described and discussed.

The second part of the book deals with the diagnosis and treatment of dental and oral disease. The material is logically arranged and each subject is presented briefly and directly. The author has been selective in choosing his information and thus has been able to include an unusually large number of subjects. The effectiveness of the text is augmented by 776 excellent illustrations, many of them in color. In addition to this there is a comprehensive bibliography—a ready reference for those who wish more information concerning a given subject. Penicillin, which is not mentioned in the second edition, is rather comprehensively discussed in the current one.

The reviewer knows of no other book of comparable size which deals with so many phases of oral pathology, usual and unusual. It is an excellent reference book and a valuable source of information for any one interested in oral pathology.—*Warren R. Schram.*

REPORTS OF COUNCILS

BUREAU OF LIBRARY AND INDEXING SERVICE

NOMENCLATURE

AFTER THE revised Bylaws were adopted by the House of Delegates in September 1948, the Bureau of Library and Indexing Service found that it was to replace the Committee on Nomenclature and to assume the duty of developing "uniform standards of nomenclature in the field of dental science." It is thus by assignment that this Bureau undertakes such a task.

In spite of the earnest work of the nomenclature committees of this and other dental associations, there is abroad in the literature and in the air criticism of the state and stature of dental nomenclature. The last extensive report by the Committee on Nomenclature of the A.D.A. was made in 1937. It is time that the nomenclature be examined again and conditions which justify criticism be corrected, if the Association is to carry out its self-appointed responsibility.

Therefore, on October 3, 1949, Dr. George B. Denton joined the A.D.A. staff to undertake a study of dental nomenclature directed toward the systematic improvement of dental nomenclature and the development of an official guide of usage for the publications of the Association. The first phase of this study has been allotted a year's time. Dr. Denton, who was Professor of Dental History and Literature at Northwestern University Dental School for 33 years, and who is presently a member of the dental subcommittee of the committee to recommend terms for *Standard Nomenclature of Disease and Operations* of the American Medical Association, has prepared a preliminary statement of some problems in nomenclature.—*Donald Washburn, Director.*

STUDY OF DENTAL NOMENCLATURE—GENERAL SURVEY

IF SYSTEMATIC improvement of dental nomenclature is to be accomplished, every term about which there is question must be studied as to the nature of the difficulty and the way in which it arose. The difficulties are of two general sorts: they are intrinsic and in the very nature of things, or they are accidental and at present remediable. Intrinsic difficulties are due either to limitations in present scientific knowledge or to inherent inadequacy of language. Accidental difficulties arise either from unclear thinking, ignorance of scientific knowledge, or inexperience with the resources and mechanics of language. It is not always possible to do anything about intrinsic difficulties beyond understanding them; ac-

cidental difficulties should be amenable to correction.

In order to study the way in which a difficulty has arisen, it is necessary to trace the meaning and use of the term from its origin to the present day, as well as the development of the concept or concepts symbolized. Only in this way is it possible to clarify the difficulty and to decide whether a present remedy exists and in what direction it may be found.

As background for this study, there should be a sketch of the efforts made by individuals and by organizations to improve dental nomenclature. This should include the work of lexicographers and scientists, of the American Dental Association, of the British Dental Association, of the Odontological Society and of recently founded organizations in special fields of dentistry. Some attention should be given to the efforts of international groups—such as international congresses and Fédération Dentaire Internationale —as well as to the contributions of European associations to the technical terminology in their own languages.

The fundamental phenomena of language development, the relations of speech to thought and the principles of language that pertain to the formation of words should be briefly presented. This part of the project is reserved for later analysis.

A completely satisfactory, impeccable term would fulfill certain desiderata, which may be grouped under three general requisites:

1. *Meaningfulness,* which concerns the correspondence of the symbol to the concept.
2. *Correctness,* which concerns the agreement of the word with the usage of the language.
3. *Facility,* which concerns the acceptance and adoption of the word.

The desiderata may be listed as follows: (1) under the heading of meaningfulness, a. *precision,* b. *descriptiveness,* c. *reticence;* (2) under correctness, a. *propriety,* b. *purity;* (3) under facility, a. *economy,* b. *familiarity,* c. *versatility,* d. *conformity,* e. *euphony,* f. *sanction.*

A term is *precise* when the boundaries of its meaning coincide with those of the concept it is intended to represent—when there is complete correspondence between the symbol and concept. A term lacks precision when it is vague, or when it implies more or less than is intended by the concept. The term "treated tooth," obviously, is less precise than the term "pulpless tooth." *Precision* is the most essential of all the desiderata of a term.

A term is *descriptive* when the meaning is suggested by the associations of the symbol. A term that merely denotes, indicates, or identifies the concept fails in descriptiveness. The term "distoclusion" is more descriptive than "Class II malocclusion." "Gingival third cavity" is more descriptive than "Class V cavity."

A term is *reticent* when its implications are limited to the essentials of the concept which distinguish it from every other concept, or when the term refrains from committing itself to uncertain or unverified implications of the concept. "Mottled enamel" is more reticent than "endemic dental fluorosis" for the reason that when the former term was introduced, the etiology was unknown. Terms for "periodontitis" such as "amoebic pyorrhea" and "alveolo-dental expulsive polyarthritis" are not reticent, as they express an etiology or pathology that is hypothetical.

A term is *proper* when it is in harmony with the rules of grammar, word formation and usage of the language. The term "devital tooth" is improper because the prefix *de-* has an active sense which requires it to be used in a verbal form only.

A term is *pure* when its elements are all taken from the same language. A hybrid word, consisting of elements from two or more languages, lacks purity. "Gingivectomy" lacks purity, since "gin-

giva" is Latin and "ectomy" is Greek. "Cavo-surface" (adj.) is also lacking in purity, since it is a combination of a Latin root and an English word. *Purity* is the least imperative of requisites.

A term is *economical* when it requires only as much time, space and energy as are necessary in order to express the concept adequately. Usually economy is measured by restriction in the number of syllables employed. However, other qualities contribute to economy such as *descriptiveness* and *familiarity*. "Chronic suppurative pericementitis" is less economical than "periodontitis."

A term is *familiar* when it or its elements are recognized to be the same as or similar to words already employed in the profession with analogous or identical meaning. "Endodontia" is less familiar than "pulp treatment."

A term is *versatile* when it is capable of inflection or other modification, in accord with language usages, to produce related terms for useful related concepts. "Gingiva" is more versatile than "gum," since it is susceptible to change into "gingival," "gingivally," "gingivitis," "gingivectomy" and the combining form "gingivo-."

A term *conforms* when it fits in or is in harmony with the terminology or concepts of dental science and of other, related sciences or occupations. "Premolar" conforms to the usage of comparative dental anatomy; "bicuspid" is used only in dentistry.

A term is *euphonious* when it is not unpleasant in sound or difficult of utterance. Such words as "cheilognathouranoschisis" lack euphony.

A term has *sanction* when through agreement of competent writers or the support of representative organizations, it is recognized as the authorized and standard form, especially for record purposes. "Denture" has the sanction of professional use; "plate" has no such sanction.

A study should be made of the language elements which commonly enter into dental terms. These elements are prefixes, suffixes and root words. The language sources of these elements, their special meanings and the mechanics of their combination should be set forth.

The examination of dental terms should be undertaken systematically according to general aspects of dentistry, as follows: (1) anatomy; (2) physiology; (3) pathoses and abnormalities; (4) operations and treatments; (5) appliances and restorations; (6) constructional materials; (7) instruments and tools; (8) therapeutic agents; (9) procedures. At present, probably, the first four divisions above should take preference in the study.

A large part of the study would be devoted to dental terms already in common use. These would be collected, critically examined and compared with a view to suggesting the most suitable. Such terms might be supplemented by a few new terms derived in accordance with the principles set forth above.

In view of the fact that many new terms are springing up in the literature and making a bid for acceptance, some part of the project should be concerned with collecting them and giving them some scrutiny and analysis. "Periapical pulp canal therapy" (J.A.D.A., Oct. 1949) is a case in point.

The body of terms used in a profession like dentistry is not merely a collection of discrete elements, but in large measure a nomenclature, a system of terms, with some features of a classification. Consequently, some considerations imposed by the systematic nature of a nomenclature do not appear in the criticism of individual terms. For instance, generic terms should be provided for groups of related concepts wherever useful. "Labial" and "buccal," for example, refer to homologous surfaces, and should have a group term, such as "vestibular" to generalize them.—*George B. Denton.*

THE AGES OF DENTISTS IN THE UNITED STATES

IN LONG-RANGE planning for—or prediction of—the future availability of dental care for the people of the United States, it is necessary to consider the present age distribution of dentists. How many of the approximately 87,000 dentists are nearing the age of retirement? How many have their most productive years ahead of them?

The mean age of all living (retired as well as active) dentists in the United States, as determined by a large random sample, is 48.07.[1] The age of every eighth dentist recorded in the alphabetical file of the Association's Membership Department was used in this study. The standard deviation of ages is 13.40. The median age, which is less influenced by the very old dentists than is the mean, is 46.68.

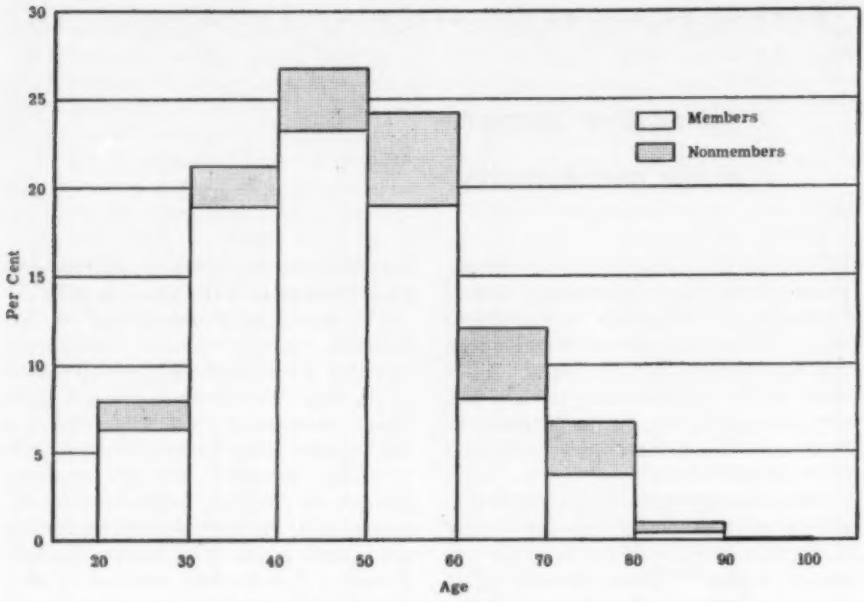
The mean age of members of the Association, 46.57, differs significantly (both in a statistical and in a practical sense) from that of nonmembers, 54.08. This difference undoubtedly reflects a tendency for older dentists, whose income is falling off either through declining practice or complete retirement, to terminate their membership. Another probable factor is the large increase in percentage of membership in recent decades, as the increment likely consisted, in the

1. Averages quoted herein were computed from ungrouped data. Only a few 1949 graduates were included.

Table 1.—Age distribution of dentists, 1949

Ages	Members			Nonmembers			Total		
	Number in sample	Per cent members	Per cent total no. dentists	Number in sample	Per cent non-members	Per cent total no. dentists	Number in sample	Per cent	Standard error of percentages
20–24	43	0.49	0.40	26	1.19	0.24	69	0.63	.95
25–29	663	7.54	6.03	143	6.52	1.30	806	7.33	.92
30–34	1025	11.65	9.33	112	5.11	1.02	1137	10.35	.90
35–39	1063	12.08	9.67	133	6.07	1.21	1196	10.88	.90
40–44	1261	14.33	11.47	171	7.80	1.56	1432	13.03	.89
45–49	1295	14.72	11.78	211	9.62	1.92	1506	13.70	.89
50–54	1212	13.77	11.03	286	13.05	2.60	1498	13.63	.89
55–59	886	10.07	8.06	281	12.82	2.56	1167	10.62	.90
60–64	512	5.82	4.66	233	10.63	2.12	745	6.78	.92
65–69	385	4.37	3.50	199	9.08	1.81	584	5.31	.93
70–74	278	3.16	2.53	205	9.35	1.86	483	4.39	.93
75–79	126	1.43	1.15	128	5.84	1.16	254	2.31	.94
80–	50	0.57	0.45	64	2.92	0.58	114	1.04	.95
Totals	8799	100.00	80.06	2192	100.00	19.94	10991	100.00	

Source: Random sample from files of Membership Department, American Dental Association.



Percentage of living dentists by ten-year age groups (data from Table 1)

main, of younger dentists. Older dentists, then, are nonmembers in greater percentages than younger dentists for two reasons: they have a tendency to drop out with advanced age; membership was not as essential or as popular when they were in their prime as it now is.

The size of the sample, 10,991, was large enough to result in very small sampling error for most of the statistics. The standard error of the grand mean is but 0.13 (which means that chances are about 95 in 100 that the mean of the entire population of dentists lies between 48.33 and 47.81). Standard errors of the percentages in the various age groups are given in Table 1.

The age distribution presented in Table 1 and the chart has at least one notable feature: there are more dentists in their forties, or in their fifties, than in their thirties. The number of dental graduates was abnormally low during the years 1930 to 1942. There were fewer graduates during the thirties than in any other decade of this century, and most in the decade beginning with 1910. A straight line fitted mathematically, by the least squares method, to the number of graduates per decade for the five decades since 1900 has a negative slope. The trend in number of new dentists per decade, considering the period since 1900 as a whole, has been downward. During this period the population of the United States has doubled.

The average ages of dentists by states and by federal government dental services are presented in Table 2, ranked from oldest to youngest average age. The fact that these averages were computed from a sample limits the conclusions that can be drawn from them, especially since some of the states have very few dentists, proportionately small samples and correspondingly low reliabilities. To test

Table 2.—Mean ages of dentists by states and by federal government dental services

State	Mean age
Oklahoma	55.19
Nevada	53.88
Kansas	53.54
New Hampshire	53.31
Montana	52.57
Iowa	52.54
Colorado	52.09
Delaware	51.83
Maine	51.79
Indiana	51.44
Nebraska	51.24
Vermont	51.14
Missouri	50.92
North Dakota	50.43
Arkansas	50.39
Alabama	50.36
Idaho	50.27
Washington	50.11
Kentucky	49.90
Oregon	49.86
Minnesota	49.73
Massachusetts	49.42
Mississippi	49.15
Tennessee	48.87
Wisconsin	48.87
Arizona	48.85
South Dakota	48.69
Wyoming	48.65
California	48.58
Utah	48.52
Ohio	48.51
Rhode Island	48.30
Pennsylvania	48.17
Michigan	47.80
Illinois	47.69
North Carolina	47.63
West Virginia	47.60
Florida	47.43
South Carolina	47.27
Virginia	47.14
Maryland	46.85
Louisiana	46.72
Georgia	46.33
District of Columbia	46.15
Texas	46.05
New York	45.96
Connecticut	45.55
New Mexico	45.53
New Jersey	44.58
Federal government dental service	
Veterans Administration	44.32
Army and Air Forces	42.54
Navy	38.94
U. S. Public Health Service	35.89
Mean age, total	48.07
Median age, total	46.68

Source: Random sample from files of Membership Department, American Dental Association.

the mean for each state for the statistical significance of its difference from the means of all other states would involve a prohibitive amount of labor. A rule of thumb is not satisfactory, for significance is a function of several variables: the magnitude of the difference in means, the variability of ages within the two states and the number in the samples from the two states. It will be well to remember that states which are adjacent in rank, or even separated by four or five states, might be reversed in position if the entire population of dentists were included in the calculations.

Table 2 reveals that dentists of the federal government dental services are considerably younger than average. These services have a definite retirement age which is probably earlier than the age at which most private practitioners retire. Also, they are inclined to employ young dentists, and they have expanded within the last decade. The mean age of the sample from the government agencies is 41.70.

The only truly satisfactory means of arriving at the ages by states would be to compute the averages from the entire population of dentists. This will not be

practical until data have been recorded on punch cards for all dentists. When that millennium has been reached, the true averages will be obtainable in a matter of hours.—*B. Duane Moen, Assistant Director.*

COUNCIL ON LEGISLATION

DIGEST OF STATE LAWS OF INTEREST TO DENTISTRY ENACTED AT SESSIONS HELD DURING 1949

THE Council on Legislation has prepared a digest of all bills of interest to dentistry which have been enacted into law during the 1949 legislative sessions. These are presented in THE JOURNAL in two parts. The first part includes the new Acts of all states from Alabama through Nevada. States in which no laws of interest to dentistry were passed are listed at the end of the report. The balance of state laws will be published in a subsequent issue of THE JOURNAL. Inquiries, corrections or changes should be addressed to the Secretary of the Council on Legislation.

Alabama

Act 187, Acts of 1949, Approved July 6, 1949.—This Act requires the County Health Officer to make a list of all children who have any congenital or acquired malformations. Physical examinations are to be made of children having congenital or acquired defects, the expense of such examination to be borne by the parents if financially able and if they select a physician of their own choice, otherwise the examinations are to be made by the County Health Officer, a "well baby clinic," or other qualified clinic. While dentists are not mentioned in the Act the report forms, upon which congenital or acquired malformations are to be reported, list harelip and cleft palate as two of the deformities to be reported.

Act 11, Acts 1949, Effective June 22, 1949.—This resolution of the State Legislature requests the members of the Congress of the United States to use whatever means may be at their disposal to defeat all acts, either direct or indirect, to socialize medical care in America.

Arizona

Chapter 29, Laws 1949, Approved March 15, 1949.—This chapter revises and amends the Dental Practice Act. It revises the definition of the practice of dentistry by removing the requirement that dental work be done for a reward. That portion of the Act is repealed which permitted a person not licensed in Arizona to make dental examinations or to teach oral hygiene in charity health clinics established by the state or one of its subdivisions when holding a special certificate from the Board. It requires the Board to hold examinations at least once a year instead of twice a year. The Board is denied the authority to grant temporary licenses in communities needing emergency services. The Board is authorized to become a member of the American Association of Dental Exami-

ners and to participate in the proceedings thereof. The provision authorizing an applicant for citizenship to take the State Board examinations is repealed. Persons who fail the State Board Examinations three times are required to take at least one year of additional postgraduate work before taking a fourth examination. The section relating to revocation of license is rewritten. Ground for revocation is "unprofessional conduct," which is defined: (1) employing persons known as "cappers" or "steerers" to obtain business; (2) obtaining a fee by fraud or misrepresentation; (3) wilfully betraying professional secrets; (4) employing unlicensed persons to perform work which can be done legally only by a licensed person; (5) practicing dentistry under a trade or corporate name or false or assumed name other than the name of a partnership containing the name of one or more of the partners; (6) making use of any advertising statement of a character tending to deceive or mislead the public; (7) gives jurisdiction to the courts to issue injunction preventing and restraining violations of the Dental Practice Act.

Arkansas

Act 302, Approved March 15, 1949.—This Act adds to the State Board of Health a licensed dentist of seven years' experience to be appointed from a list of three names submitted by the Arkansas State Dental Association.

H. Con. Res. 4, Approved January 28, 1949.—Memorializes the Congress of the United States not to federalize the practice of medicine.

California

Chapter 961, Laws 1949, Approved July 18, 1949.—Chapter 961 amends Section 1628 of the Business and Professions Code to require that applicants for examination to practice dentistry, who have graduated after 1921, must also present satisfactory evidence of having completed, at a reputable dental college, the full number of academic years of undergraduate courses required for graduation.

Chapter 710, Laws of 1949, Approved June 18, 1949.—Chapter 710 revises certain sections of the Health and Safety Code. It directs the State Department of Public Health to establish and maintain a Division of Dental Health to study, plan and, under the supervision of the Director of the Department of Health, to administer all functions in relation to dentistry. It requires all matters relating to dentistry to be referred to the Dental Division. The Chief of the Dental Division is required to be a graduate dentist eligible to license in California. The Division is granted the power and authority to initiate and develop educational activities designed to protect and improve the dental health of the people; to initiate and develop research programs; to correlate the work of the Division in health procedures, research and administration. The Division is authorized to receive any financial aid granted from any source. Service must be performed by duly licensed personnel. This chapter is made specifically applicable only to persons in the employ of the Department of Health.

Chapter 683, Laws of 1949, Approved June 16, 1949.—This chapter amends Sections 1670-1679 of the Business and Professions Code to permit the Board to reprimand or place on probation any dentist, in addition to the power to revoke or suspend his license for unprofessional conduct or gross ignorance or inefficiency in his profession, or for the conviction of a felony or misdemeanor involving moral turpitude.

Chapter 501, Laws of 1949, Approved June 3, 1949.—Chapter 501 amends the

Education Code so that the absence of a pupil from school for the purpose of having dental service rendered shall not be deemed an absence in computing average daily attendance.

Colorado

Senate Bill 221.—Increases dental examination fee from $25 to $50; the annual registration fee from $2 to $4; the application fee for license as a dental hygienist from $10 to $20. Requires that hereafter each dental hygienist re-register annually before the first day of March and pay an annual registration fee of $2.

Connecticut

Special Act 508, Approved July 26, 1949.—Among other things this Act authorizes the Board of Commissioners of Public Health of the City of Waterbury, Connecticut, to establish and operate such dental and medical clinics as it may deem essential for the prevention of disease and the preservation of public health.

Connecticut Public Act 247, Approved July 22, 1949.—This Act authorizes the State Department of Health to make examinations in state laboratories of supposed morbid tissues; laboratory tests for the diagnosis and control of preventable diseases; laboratory work in the field of sanitation and research studies for the protection and preservation of the public health. It provides that such examinations may be made free of expense upon the application of licensed dentists.

Public Act 150, Approved June 22, 1949.—To the description of the practice of dentistry Public Act 150 adds a new sentence, which reads as follows: "No provision of this Section shall be construed to prevent regularly enrolled students in and graduates of dental schools approved as provided in this Chapter or medical schools approved as provided in Chapter 207 from receiving practical training in dentistry under the supervision of a licensed dentist or physician in a dental or medical school in this state or in any hospital, infirmary, clinic, or dispensary affiliated with such school."

Senate Resolution 45, Adopted May 2, 1949.—This Resolution petitions Congress to refrain from imposing upon the nation any form of compulsory health insurance or system of medical care designed for national bureaucratic control.

House Resolution 42, Adopted May 12, 1949.—House Resolution 42 is the same as Senate Resolution 45.

Florida

Senate Memorial 37, Approved May 9, 1949.—Memorializes Congress to oppose legislation for the enactment of socialized medicine or compulsory health insurance.

Georgia

Governor's Act 325, Approved February 25, 1949.—This Act amends the Georgia Dental Practice Act to authorize chartered and accredited dental schools to establish and collect charges for service rendered by students when under the supervision of a licensed dentist. It increases the number of members of the Board of Dental Examiners from five to seven. A college teachers' license is established for dentists holding licenses from another state for the sole purpose of teaching or demonstrating dentistry in a regularly licensed dental college or clinic in Georgia, the cost of the license to be $25. The Eligibility of Applicants Clause is amended to require that applicants have a general average of at least 75 per cent on the Board examinations and that all applications be received by the Joint Secretary of State Examining Boards at least 90 days before the examination if

applicants have been graduated more than one year, or 30 days if applicants have been graduated less than one year.

Governor's Act 290, Approved February 25, 1949.—Governor's Act 290 repeals the Section of the Georgia Code which sets out qualifications of dental nurses and dental hygienists. It requires dental hygienists to pass a written and clinical examination for which a fee of $10 shall be paid. It requires the Board of Dental Examiners to issue licenses to dental hygienists who pass the examination and requires the posting and display of such licenses.

Governor's Act 290 also requires the dental hygienist licenseee to be 19 years of age, of good moral character, a graduate of a dental hygiene school or college conducting a course of not less than one academic year which is recognized by the Board of Dental Examiners. The Act contains a saving clause for presently licensed dental hygienists now employed by Georgia dentists who within either two years from the date of the Act, or until such time as a dental hygienist school recognized by the Board is established in Georgia, apply for the examination. It requires dental hygienists to perform their duties only under the supervision of a licensed dentist and limits their work to the removal of calcareous deposits, secretions and stains from the normally exposed surfaces of teeth, and to apply ordinary wash or washes of a soothing character and to do sterilization and office routine. This Act requires annual registration of dental hygienists with an annual registration fee of $1. It authorizes the Board of Dental Examiners to suspend or revoke the license of any dental hygienists for certain violations, and makes it a misdemeanor to engage in the practice of dental hygiene without first securing a license.

This Act was held constitutional by the Georgia Supreme Court on October 11, 1949, in Lamons vs. Yarbrough, 55 S.E. 2d 551.

Idaho

Chapter 102, Laws 1949.—Chapter 102 completely revises the Idaho Dental Practice Act, including provisions relating to dental hygiene. (Pamphlet copies are available from the Department of Law Enforcement of the state of Idaho.)

Illinois

Amends Section 55 of the Civil Administrative Code of Illinois, Approved August 2, 1949.—Among other things, the Department of Health is authorized to accept, receive and receipt for federal moneys allotted to the state of Illinois for general health purposes, service and programs, including dental health programs.

Act of August 3, 1949.—This Act makes it a misdemeanor, punishable by a fine not to exceed $200, or imprisonment in the county jail not to exceed six months, or both, for the violation of, or refusal to obey, any rule or regulation of the Department of Public Health of the state of Illinois.

Indiana

Chapter 157, Laws 1949, Approved March 8, 1949.—Chapter 157 enacts the Public Health Code of Indiana.

Chapter 248, Laws of 1949, Approved March 11, 1949.—Chapter 248 amends and revises the Indiana Dental Practice Act. It requires applicants for dental licenses to be citizens of the United States. It provides for the issuance of dental or dental hygienist intern certificates to persons appointed to dental internships in a hospital or similar institution or appointed as an instructor in a dental school

or as a teacher or an operator in a clinic or public or parochial school, college or university. The chapter requires such practice to be under the supervision of a licensed dentist and limited to the bona fide patients of the hospital or institution. A fee of $5 is required for such certificates which must be renewed annually. The Board of Dental Examiners is authorized to re-license a dentist whose certificate and license have previously been revoked. Chapter 248 authorizes the Board of Dental Examiners to affiliate with the American Association of Dental Examiners. It charges the Board with the duty of administering and enforcing laws pertaining to the practice of dentistry and dental hygiene, and authorizes the Board to promulgate and enforce regulations. The section relating to offenses for which a certificate may be revoked is rewritten.

Maine

Act of May 5, 1949.—This Act authorizes the State Examining Board to conduct examinations for the practice of dentistry either in Maine or in any New England dental college, school, or dental department of a university recognized by the A.D.A. as having reputable and satisfactory educational standards. It increases the fee for examination of dental hygienists and the fee for licensing of a dental hygienist by reciprocity from $10 to $25. The Act removes the requirement for reciprocity admission to practice dentistry that the applicant shall have practiced at least five years in the state of his original license.

Act of April 25, 1949.—Dentists in the state of Maine are authorized to prefix the title "Doctor" or the letters "Dr." to their names.

Maryland

Resolution 7, Approved March 31, 1949.—This Resolution memorializes Congress not to federalize the practice of dentistry.

Massachusetts

Chapter 726, Laws of 1949, Approved August 22, 1949.—Chapter 726 makes it an unfair educational practice for an educational institution to refuse to admit any student on account of race, religion, color or national origin. It makes an exception in the case of religion for denominational schools. The Board of Education is given the authority to enforce the Act.

Chapter 576, Laws of 1949, Approved July 21, 1949.—Chapter 576 amends the law relating to the licensing of dental hygienists so as to remove the right of persons who are graduates of training schools for nurses and who have received three months clinical training in dental hygiene to apply for a license as a dental hygienist. It changes the pronoun "her" to the pronoun "his" in referring to dental hygienists. The duties of a dental hygienist are defined: (1) remove all tartar deposits, accretions and stains from the exposed surfaces of the teeth and directly beneath the free margin of the gum; (2) polish the teeth and fillings therein; (3) record or report to a registered dentist any oral conditions observed; (4) make topical applications of medicinal agents to the teeth and other oral tissues for prophylactic purposes; (5) assist a registered dentist in any phase of operative and surgical procedures in dentistry and in anesthesia.

Chapter 564, Laws of 1949, Approved July 18, 1949.—Chapter 564 grants the right to an applicant failing in an examination to take two additional examinations within three years upon the payment of a fee of $10 for each such examination. For subsequent examinations a fee of $40 will be required. The fee for

limited registrations is increased from $5 to $10.

Chapter 473, Laws of 1949, Approved July 1, 1949.—The Department of Public Health is authorized to institute a special program of dental research for the training of feminine personnel who shall have been enrolled as hygienists. The program is placed under the supervision of the Department of Public Health for a period of five years and all funds are required to be furnished by the United States Government. The Commissioner of Public Health with the approval of the Board of Dental Examiners may cancel the program at any time during the five-year period if it is not progressing satisfactorily.

Students enrolled in the program are authorized to prepare and fill cavities in children's teeth under the supervision of a registered dentist in a dispensary or clinic approved by the Commissioner of Public Health.

Chapter 333, Laws of 1949, Approved May 24, 1949.—Chapter 333 strengthens the Dental Practice Act by re-defining who shall be deemed to be practicing dentistry: "A person shall be deemed to be practicing dentistry if he holds himself out as being able to diagnose, treat, operate, or prescribe for any disease, pain, injury, deficiency, deformity, or other condition of the human teeth, alveolar process, gums or jaws, and associated parts, intraorally or extraorally, or if he either offers or undertakes by any method to diagnose, treat, operate or prescribe for any disease, pain, injury, deficiency, deformity, or other condition of the same; or if he except on the written prescription of a registered dentist and by the use of impressions made by a registered dentist, directly or indirectly by mail, carrier, personal agent, or by any other method, supplies, constructs, reproduces, relines, repairs, adds or directs the application of any substance to dentures, bridges, appliances or other structures to be used and worn as substitutes for natural teeth; or if he places such substitutes in the mouth or adjusts the same."

Michigan

Senate Con. Res. 19, Adopted May 6, 1949.—Memorializes Congress not to adopt legislation relative to socialized medicine.

Minnesota

Chapter 405, Laws of 1949, Approved April 14, 1949.—Chapter 405 enacts a law relating to county or multiple county health departments. It requires that at least one of the members be a doctor of dental surgery authorized to practice in Minnesota.

Missouri

Chapter 57, Laws of 1949, Approved February 25, 1949.—Chapter 57 creates a State Board of Health of seven members, one of whom shall have the degree of doctor of dental surgery. This Act is a reorganization of the existing State Board of Health.

Nebraska

Act of May 21, 1949.—This Act revises the School Code of Nebraska. Every teacher is required to examine separately each child under his jurisdiction to ascertain if such child is suffering, among other things, from diseased teeth. The teacher shall notify the parent of the child of the defect in writing. The Board of Education or similar school authority may employ licensed physicians to make required tests.

Act of March 17, 1949.—This Act establishes a Division of Dental Health in the Department of Health to be headed by

a Chief who is a graduate of an approved college of dentistry, licensed to practice dentistry in Nebraska or some other state and who has completed at least one full year of study in an accredited school of public health. The duties of the Division are to be the promotion and development of activities which will result in the practice and improvement of the dental health of the people of the state.

Act of March 21, 1949, Dental Hygienist Licensing Act. — The Dental Hygienist Licensing Act provides that any person of good moral character, who is a graduate of an accredited high school or equivalent, who is a graduate of a dental hygienist training school approved by the Board of Examiners in dentistry, which school must offer at least a two-year course, is eligible for examination for a license as a dental hygienist. The Act provides for an application fee of $25 and an annual license renewal fee of $1.00. It provides for reciprocity. It authorizes any licensed dentist, public institution, or school authority to employ licensed dental hygienists; authorizes dental hygienists to remove lime deposits, accretions and stains from the surface of the teeth and to polish teeth. The Act requires all work to be done under the supervision of a licensed dentist and limits the number of hygienists employable by one dentist to one. It provides for an injunctive procedure to restrain violations of the Act.

Legislative Resolution 2, Adopted January 10, 1949.—Resolution 2 memorializes Congress to prevent the enactment of compulsory health insurance legislation.

There were no laws of interest to dentistry passed in these states: Iowa, Kansas, Kentucky, Louisiana, Mississippi and Nevada.

COUNCIL ON DENTAL THERAPEUTICS

HOUSE CONFIRMS RECOMMENDATION TO DISCONTINUE ACCEPTANCE OF PRODUCTS FOR CLINICAL TRIAL

A DECISION of the Council on Dental Therapeutics to discontinue the listing of products as "Accepted for Clinical Trial" was confirmed by the House of Delegates at the 1949 annual session of the American Dental Association. Current agreements with firms whose products are included in this class will be honored but there will be no additions to the list or extension of acceptance. This revised policy does not represent any change in objectives. It was considered advisable to discontinue the classification, however, because of the confusion and misunderstanding which resulted from listing products in this manner.

The objectives of the Council in creating the clinical trial category were:

1. To encourage the development and promotion of new dental products in accordance with the best scientific and professional standards.

2. To stimulate and encourage careful clinical evaluation of all new items which give promise of being useful for the prevention or treatment of dental disease.

Amurol Tooth Powder, Craig-Martin

Ammoniated Tooth Powder, DyBasik Tooth Powder and Ingram Ammonium Ion Tooth Powder are listed in this category. The period of limited acceptance of these products will expire on February 1, 1950.

These dentifrices were accepted under the following conditions:

1. They are safe and effective when used as cleansing dentifrices.
2. They are supported by preliminary, but not conclusive, evidence of therapeutic value.
3. A clinical trial to determine their therapeutic value is in progress.

Discontinuance of the clinical trial classification does not imply any fault with the products or the manner of their distribution. These items are satisfactory for use as cleansing dentifrices. In the event that adequate evidence is obtained to confirm the therapeutic usefulness of ammoniated dentifrices, these products may be considered for acceptance in accordance with the usual procedure.

COUNCIL ANNOUNCES ACCEPTANCE OF NOVOCAINE 2%, PONTOCAINE 0.15% WITH COBEFRIN 1:10,000

THIS PRODUCT, which was accepted by the Council on Dental Therapeutics on October 1, 1949, is a 2 per cent procaine solution of conventional composition to which 0.15 per cent of tetracaine (Pontocaine) HCl has been added.[1] It has been the subject of several publications.[1-3]

The product was submitted to the Council in 1940, but was not accepted sooner for three principal reasons:

1. Since the systemic toxicity of the product was assumed to be approximately equivalent to that of procaine 3 per cent with nordefrin (Cobefrin) 1:10,000, it was necessary to show how it compares with the latter product in profundity and duration of anesthetic effect.
2. It was marketed for routine use whereas it is a special purpose anesthetic.
3. The addition of tetracaine, which is known to have a relatively high toxicity and is reported to have been responsible for some cases of dermatitis, was not supported by adequate evidence of safety.

The first point has been met by the report of a controlled clinical investigation.[4] The second point has been met by an agreement on the part of the firm to include the following statement on all packages of the product, "Notice—Use where profound or prolonged anesthesia is required. Novocain 2%-Cobefrin 1:10,000 is suggested for ordinary routine procedures."

The third point requires some discussion. Any effect which the presence of tetracaine may have on the systemic toxicity of the mixture must be relatively small, if one is to judge from the generally favorable comments of the dentists who have used the product and from the

1. Council on Dental Therapeutics, American Dental Association, Council Declares Novocain-Pontocaine-Cobefrin Not Acceptable for Accepted Dental Remedies. *J.A.D.A.* 32:494 (April) 1945.
2. Council on Dental Therapeutics, American Dental Association, Preliminary Report on Novocain-Pontocaine-Cobefrin Solution, R. B. Waite. *J.A.D.A.* 29: 2247 (Dec.) 1942.
3. The Other Half of the Picture. (Editorial) *J.A.D.A.* 32:1091 (Aug.) 1945.

results of clinical investigations.[4,5] On the same basis, it might be assumed that true allergy to tetracaine is not significantly more common than true allergy to procaine. The Council's survey of the incidence of occupational dermatitis among dentists has not yielded evidence that the widespread use of this product by dentists has been responsible for any increase in incidence of occupational dermatitis.[6,7] There is evidence that dentists who are hypersensitive to tetracaine are also hypersensitive to procaine.[8]

Acceptance of the product is, therefore, announced. Its use is recommended only in those instances where prolonged anesthesia is desired or where anesthesia is difficult to obtain with simple 2 per cent procaine solutions or preparations of equivalent potency.

4. Winter, Leo, and Tainter, M.L., A Clinical Evaluation of Local Anesthetic Solutions of Increased Strength. *Am. J. Orthodont. & Oral Surg.* 31:307 (May) 1945.

5. Epstein, Sidney; Throndson, A. H., and Schmitz, J. L., Comparative Study of Local Anesthetic Solutions in Clinic and Private Practice. (In press)

6. Council on Dental Therapeutics, American Dental Association, Council to Investigate Occupational Dermatitis. *J.A.D.A.* 35:677 (Nov. 1) 1947.

7. Council on Dental Therapeutics, American Dental Association, Council Reports Progress in Study of Occupational Dermatitis Among Dentists. *J.A.D.A.* 38: 148 (Jan) 1949.

8. Laden, E. L., and Wallace, D. A., Contact Dermatitis Due to Procaine: A Common Occupational Disease of Dentists. *J. Invest. Dermat.* 12:299 (May) 1949.

COUNCIL LISTS PRODUCTS FOR "ACCEPTED DENTAL REMEDIES"

THE Council on Dental Therapeutics of the American Dental Association announces the inclusion of the following products in the list of *Accepted Dental Remedies:*

Anesthetics—Local[1]

Procaine HCl 4%, Neo-Synephrine 1:2500—Larson: Composition: See S. F. Durst & Co., *A.D.R.*, ed. 15, p. 29.

Distributed by M. Larson Company, Inc., Chicago.

Sedatives and Hypnotics[2]

"Acetidine" Tablets Aspirin, Acetophenetidin and Caffeine: Each tablet is stated to contain acetophenetidin, 0.1176 Gm.; caffeine, anhydrous, 0.0294 Gm.; starch, 0.0676 Gm.; gelatin, 0.0068 Gm.; acetylsalicylic acid, 0.1770 Gm., and talc, 0.0086 Gm.

Manufactured by Sharp & Dohme, Inc., Glenolden, Pennsylvania.

Admission to *Accepted Dental Remedies* means that the product was found to conform to the rules of the Council when it was accepted. Accepted products are reconsidered periodically. The files of the Council contain information on many drugs and dental cosmetics and inquiries are welcomed.—*J. Roy Doty, Secretary.*

1. *A.D.R.*, ed. 15, p. 19.
2. *A.D.R.*, ed. 15, p. 166.

CASES AND COMMENTS

Erythema Multiforme: Report of a Case.

Harry Roth, B.S., D.D.S., Assistant Professor of Periodontia, New York University College of Dentistry.

A male patient, 21 years of age, was referred to me on June 28, 1949 for treatment of acute necrotizing ulcerative gingivitis. There was pain on eating and talking and difficulty in deglutition. He appeared feverish and cachectic and gave a history of a similar attack a year previously.

On clinical examination the lesions, which were very painful, were found to be erosive and to bleed easily. Most of them were confined to the gingival margins and some of them extended to the areolar mucosa. However, it was noted that the interproximate papillae were intact (Fig. 1) and not punctated as in acute necrotizing ulcerative gingivitis. A tentative diagnosis of pemphigus or erythema multiforme was made but it was not possible to differentiate with certainty at this stage since there were no skin lesions at the time of examination. The patient was referred to a dermatologist and at this time skin lesions appeared on his wrists and knees. A definite diagnosis of erythema multiforme was then made. Three weeks after treatment with bland mouth washes, parenteral injections of liver extract, vitamin B complex and penicillin, the lesions disappeared.

Etiology

This disease is of unknown etiology but may be caused by allergy to drugs, foods, bacteria and so forth.

Symptoms

Oral lesions are usually of the vesicobullous type. Probably 50 per cent of skin type lesions are associated with oral involvement. The lesions usually appear on the buccal and labial mucous membrane. They are painful and are partially covered by a grayish pseudomembrane which simulates both pemphigus and acute necrotizing ulcerative gingivitis.

In severe cases, as in the one presented, inflammatory erosive areas may be present, covered with patches of loose, grayish white shreds which are the remains of ruptured, bleeding vesicles. Pain on eating and talking and difficulty in deglutition are also typical.

Diagnosis

The presence of typical skin lesions usually makes the diagnosis certain. In cases in which lesions are present only in the mouth, a diagnosis of pemphigus or acute necrotizing ulcerative gingivitis is often made. Examination of smears from the lesions and the presence of interproximate papillary ulceration and destruction aid in the differential diagnosis. Smears from the lesions of necrotic gingivitis show a preponderance of fusospirillary organisms. Allergic reactions to foods, drugs, toxins, and so forth should, of course, be ruled out before treatment is started.

Prognosis and Treatment

The prognosis is usually favorable. The disease usually runs a course of from two to three weeks. Yearly recurrences, as in this case, are common. Treatment consists in the administration of a saline cathartic, the prescription of a bland diet similar to that of an infant, and therapeutic doses of a multiple vitamin preparation. Warm irrigations every hour with a mild alkaline solution will give some relief. Injection of penicillin to reduce secondary infection is also found to be of value.—*156 East 52nd Street.*

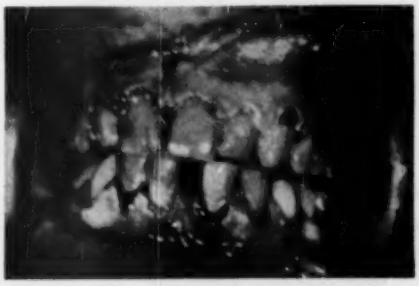


Fig. 1.—Erythema multiforme. Note erosion of gingival margins. Interproximate papillae are not punctated as in necrotizing ulcerative gingivitis

Eruption and Root Calcification Following Root Canal Therapy of a Young Incisor: Report of a Case.

By Louis B. Kelsten, D.D.S., Newark, N. J.

A girl, 7 years of age, came to me on February 20, 1948 with an acutely edematous area over a fractured maxillary central incisor that had partially erupted. Her parent said she had been injured by a fall two weeks previously.

A roentgenogram revealed that calcification of the root of the incisor was little more than half complete and that there was a wide open apical foramen. Because of the acute condition, procaine hydrochloride containing 50,000 units of penicillin was carefully injected above the swollen area. When the pain had been relieved, an impression of the area was taken with alginate paste to serve as a record.

On the following day pain and the swelling were gone. However, the fractured central incisor failed to respond to vitality tests. The mother was therefore informed that the tooth required observation.

On March 26, when the child returned for routine dentistry, it was found that a draining fistulous tract had developed labially and at the apical area of the injured tooth. Since the incompletely formed incisor had a funnel-shaped root canal with a wide open apical foramen, root canal therapy seemed contraindicated. Besides the tragedy to the youngster of losing the anterior tooth, there was also the problem of space maintenance. In this young, developing mouth any type of appliance, fixed or removable, unless continually adjusted and altered, would have an inhibitory influence on tooth eruption and on the growth of the arches in width and height as well as in anteroposterior directions. Because of these factors, it was decided to treat the tooth so as to preserve it as long as possible, if only as a means of space retention, until the other permanent teeth had erupted into position.

With a sterilized round bur no. 8 on the contra angle, the tooth, isolated with cotton rolls, was opened from the lingual side and the contents removed from the pulp chamber. Then with a sterilized round bur no. 6 on the handpiece rotating slowly up to the apex, the distance having been determined from the roentgenogram, the root canal was carefully cleaned. With a Luer glass syringe fitted with an 18-gage needle, the canal was washed with Zephiran Chloride and dried with a large absorbent point and compressed air. Paste taken from a preparation consisting of 1 million units of penicillin and 1 million units of streptomycin in 2 cc. of peanut oil was warmed

Fig. 1.—At onset of infection Feb. 20, 1948. Note incompletely calcified root apexes

Fig. 2.—Stone cast of incisor region from impression taken Feb. 20, 1948. Note edematous area over injured, partially erupted central incisor

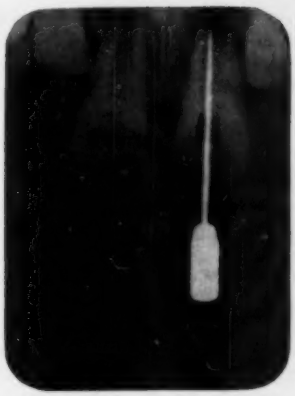


Fig. 3.—Measuring length of incompletely calcified root with spiral broach reamer. Note funnel-shaped canal with wide open foramen

Fig. 4.—Root canal filled with homemade gutta percha point and antiseptic paste, pumped beyond the apex

slightly over a flame and pumped into the canal and beyond the root apex with a smooth reamer. The tooth was then sealed with temporary cement.

At the next visit (March 29) the labial mucous membrane showed tissue regeneration where formerly there had been the fistula. With the aid of a roentgenogram, the length of the root was measured by means of a reamer placed up the root canal. Since the canal was too wide at the apex for an ordinary point, a piece of baseplate gutta percha was heated and rolled on a glass slab, until it fairly accurately compared in size to the

Fig. 5.—Sept. 11, 1948. Absorption of paste and evidence of root calcification

Fig. 6.—June 21, 1949. Fractured incisor with acrylic jacket more than a year after root canal treatment. Note root calcification, bone regeneration, and further eruption of injured tooth

funnel-shaped canal, and then placed in phenol for sterilization. Antiseptic paste consisting of beechwood creosote and Postolene was then pumped up the root canal and beyond the root apex, the homemade point was carefully placed up the root canal and a roentgenogram was made. Following this, the tooth was sealed with cement and the patient dismissed.

Several months later (September 11, 1948) clinical examination revealed that the tooth had erupted further and that the labial mucous membrane over the tooth appeared normal. Moreover, a roentgenogram showed that most of the paste had been absorbed and also surprising evidence of some root calcification. For cosmetic reasons, the tooth was sliced mesially and distally and an acrylic jacket simulating the left central incisor was fabricated and cemented over the fractured incisor.

On June 21, 1949, or more than a year after root canal therapy, clinical observation revealed that the treated tooth had erupted like its sister incisor. Furthermore, a roentgenogram showed evidence of further root calcification and development of bone in the area that had formerly been radiolucent.

Summary and Conclusion

The accompanying roentgenograms (Figs. 1 to 6), taken between February 20, 1948, the time of the onset of the acute infection, and June 21, 1949, more than a year after treatment, reveal that a young, incompletely formed incisor that had become infected due to injury can continue to erupt, and its root calcify, after root canal therapy. Moreover, the retention of the incisor in this particular case eliminated the necessity for mechanical space maintenance which, unless continually corrected, would have been a menace to the growth of the jaws, to the health and normal arrangement of the teeth, and to the over-all dentofacial development of the patient.—*427 Lyons Avenue.*

▲

The Trend.—"Time was when the public health officer was verbally if not actually stoned for tacking the red scarlet fever sign on the door—when the legal diagnosis of contagious disease and enforced quarantine was an un-American invasion of the family's and family doctor's rights. The Country has come a long way. Recently the United States Public Health Service has entered new and wider areas of investigation; for instance, community surveys of heart disease and diabetes, and latterly the incidence of marriage and divorce. . . . All pollsters are to be feared, even those bearing such fascinating gifts as Dr. Kinsey and his colleagues do. Nevertheless, the interest of public health authorities in the plain, uninterrupted figures on marriage and divorce means a beginning in the epidemiology of morals."—*From an editorial titled "The Epidemiology of Morals" in Vol. 241, No. 5, July 1949, The New England Journal of Medicine, p. 218.*

CURRENT LITERATURE

Journal of Dental Research
October, 1949

Titles marked with an asterisk are reviewed below.

*Amount of Mercury Vapor in Air of Dental Offices and Laboratories. Louis I. Grossman and James R. Dannenberg, University of Pennsylvania, Philadelphia.—435.

*A Clinical Study of Amalgam Failures. Harry J. Healy and Ralph W. Phillips, Indiana University, Indianapolis.—439.

*Maintenance of Equilibrium in Reversible Hydrocolloid Impressions. III. A Report on Tests Made with Five Stock Impression Materials. Allison G. James, Beverly Hills.—447.

*Copper Plating of Reversible Hydrocolloid Impressions. Owen D. Dwight, Los Angeles.—456.

Tobacco and Gingivitis. II. Correlation Between Consumption of Tobacco, Ulceromembranous Gingivitis and Calculus. Jens Jorgen Pindborg, Royal Danish Navy Dental Corps, Copenhagen.—460.

Tobacco and Gingivitis. III. Difference in the Action of Cigarette and Pipe Smoking. Asger Frandsen and Jens Jorgen Pindborg, Royal Danish Navy Dental Corps, Copenhagen.—464.

*Some Characteristics of Caries on the Proximal Surfaces of the Teeth. John Haddin Barr, University of Texas, Houston, Tex.—466.

*The Condition of the Teeth and the Attachment Apparatus in Tuberculosis. Irving E. Gruber, Brooklyn.—483.

Carious Lesions in Cotton Rat Molars. V. An Effect of the Type of Cage and Bedding on the Initiation and Development of Carious Lesions. James H. Shaw, Harvard University.—495.

Biochemical Production of Oxalic Acid from Carbohydrates. G. E. Crowell and N. C. Turner, The Forsyth Dental Infirmary, Boston.—499.

*Terminal Alkalinity in Saliva-Phenol Red Glucose Broth Cultures. Marshall L. Snyder and Margery K. Clarke, University of Oregon, Portland.—503.

*The Ascorbic Acid Content of the Saliva of Carious and Noncarious Individuals. W. C. Hess and B. T. Smith, Georgetown University, Washington, D. C.—507.

*The Chemical Nature of the Proteins from Human Enamel. F. L. Losee and W. C. Hess, Georgetown University, Washington, D. C.—512.

*Comparative Protein Chemistry. Richard J. Block, M. K. Horwitt, and Diana Bolling, New York Medical College, and Elgin State Hospital, Elgin, Ill.—518.

*Decalcification of Bone and Teeth Under Vacuum—A Rapid Method for Producing Hard Tissue Preparations. Jens Waerhaug, State Dental Institute of Stockholm, Sweden.—525.

International Association for Dental Research. Proceedings of the New York Section, May 5, 1949.—527.

Amount of Mercury Vapor in Air of Dental Offices and Laboratories. Louis I. Grossman and James L. Dannenberg.

Although mercury is commonly used by dentists for making dental amalgam fillings and by dental technicians for dental amalgam dies, no data are available regarding possible toxic effects from mercury vapor in dental operating rooms and laboratories. For this reason, the amount of mercury vapor present in 50 dental operating rooms, dental laboratories and commercial dental laboratories was determined by means of a General Electric mercury vapor detector of the instantaneous type.

The volume of mercury vapor was found to be so low that interpolation on a calibration curve in parts per million was not practicable. Instead, meter readings were used and compared with the meter reading of a minimum toxic amount of mercury vapor; namely 50. The average finding for dental operating rooms was 3.2, with a range of from 0 to 12. Laboratories associated with dental offices averaged 4.1, and ranged from 2 to 6. Commercial laboratories averaged 8.6. The authors conclude that the amount of mercury vapor in the average dental office or laboratory is not toxic.

A Clinical Study of Amalgam Failures. Harry J. Healy and Ralph W. Phillips.

A group of 1,521 defective amalgam restorations were studied for the purpose of determining the causes of failure. (These patients at the Indiana University School of

Dentistry were examined by two operators.) It was found that the failures could be grouped into those due to: (1) actual recurrent caries, (2) fracture, (3) dimensional change and (4) pulp or periodontal involvement; the frequency occurring in that order.

The main factor which contributed to the failures were judged to be: (1) improper cavity preparation which was the causative factor in 56 per cent of all the failures, (2) faulty manipulation of the amalgam or its contamination at the time of insertion—40 per cent of all failures.

It is apparent from this study that the clinical success of the amalgam restoration is dependent upon many factors, most of which can be controlled by the dentist. Careful cavity preparation, proper manipulation and restoration of normal anatomical contour can reduce to a minimum clinical failure of amalgam.

Maintenance of Equilibrium in Reversible Hydrocolloid Impressions. III. A Report on Tests Made with Five Stock Impression Materials. Allison G. James.

Five reversible hydrocolloid impression materials purchased in the open market were tested by the procedure described in Part I.

One material was tested for maintenance of equilibrium in control solution supplied by the manufacturer, in 2 per cent potassium sulfate, and in water. The other materials were tested only in water, as recommended by the manufacturers. Two of the materials contracted and produced oversized dies; three expanded and produced undersized dies. Three of the materials consistently produced inaccurate dies upon immediate pouring of the impression; results with the material tested in salt solutions were no better than obtained in tap water.

In this series of three papers, tests have been made with eight different brands of reversible hydrocolloids; four are in the group which contracts, four in the group which expands at a critical end point of time. Since they are all agar bases, it is assumed the fillers used cause the expansion or contraction, and further study of this is indicated. To be considered acceptable, reversible hydrocolloid impression materials must produce accurate control dies when impressions are poured immediately.

Copper Plating of Reversible Hydrocolloid Impressions. Owen D. Dwight.

Hydrocolloid impression materials offer the dentist unprecedented accuracy for restorative work including inlays, crowns, bridges, jackets and attachment partials; but a positive die material harder than artificial stone has not been available until now.

The first approach to the missing link in the indirect inlay technic has been to electrodeposit metallic copper successfully upon the surface of the hydrocolloid impression to form a copper die. Numerous difficulties were encountered since hydrogel is essentially immobilized water (90 per cent water) and therefore behaves completely differently, during plating, from compound or wax.

It is hoped that, with the development of this process, better dentistry may be accomplished on accurate indestructible models, thus enabling the work to be carried nearer to completion on the laboratory bench.

Some Characteristics of Caries on the Proximal Surfaces of the Teeth. John Haddin Barr.

Patterns of proximal caries attacks on individual teeth display a striking measure of bilateral symmetry for the aggregate experience of groups of cases, but actual bilateral symmetry is seldom encountered in individual cases. There is high interregional correlation between total maxillary and mandibular incidence in posterior teeth, and between maxillary anterior and total (maxillary and mandibular) posterior teeth, except where the anterior maxillary teeth are caries-free. Approximation of surfaces is confirmed as an important factor. Caries experience does not show clear relation to age or sex in the groups studied. Difficulties in selecting a basis for assessing caries experience are discussed and a procedure is suggested. Patterns of developing caries attacks are shown to be similar at differing levels of intensity of the attack. Various individual proximal surfaces are ranked according to their relative caries susceptibility.

The Condition of the Teeth and the Attachment Apparatus in Tuberculosis. Irving E. Gruber.

The teeth and the attachment apparatus in 200 adults with tuberculosis were evaluated statistically and the findings were correlated with the data obtained from similar studies that had been reported in the literature. The

investigation was undertaken to determine if there were any oral signs which could be established as pathognomonic of tuberculosis.

The Class V cavity was not found to be characteristic of tuberculous patients. The DMF value obtained indicated no higher incidence of hard structure defects in tuberculous patients as compared to that obtained in supposedly healthy individuals. A high incidence of healthy appearing periodontal tissue and a slight amount of recession were observed, indicating no unusual periodontal involvement in the tuberculous patient. The DMF rate was found to be higher, and there was more periodontal involvement in males than in females. As age increased, there was a corresponding increase in the DMF rate as well as in the amount of periodontal involvement.

No conclusions were warranted inasmuch as so few cases were examined. However, it was apparent that there were no oral signs which could be established as pathognomonic of tuberculosis.

Terminal Alkalinity in Saliva-Phenol Red Glucose Broth Cultures. Marshall L. Snyder and Margery K. Clarke.

Production of terminal alkalinity in 4 to 30 days after initial acidity in saliva-phenol red glucose broth cultures indicated breakdown of organic nitrogenous material in medium with release of basic end products. This comes under the broad heading of proteolysis and, because of recent interest in the role of proteolysis in dental caries, warranted investigation. It was shown to be caused almost exclusively by members of the genus Candida (Monilia). These organisms occur in about 25 per cent of all specimens of saliva. Of these, 60 per cent (15 per cent of specimens of saliva) produce this reaction in saliva-glucose broth cultures, but under controlled conditions all strains tested (30) gave the same reaction. Each component of the medium—peptone, meat extract, and glucose—was tested at varying pH. Glucose in concentrations greater than 1 per cent delayed appearance of alkaline end points but did not prevent reversion in 30 days.

The Ascorbic Acid Content of the Saliva of Carious and Noncarious Individuals. W. C. Hess and B. T. Smith.

Ascorbic acid was determined in saliva by the colorimetric method of Roe and Keuther. The average value for 31 noncarious individuals was 0.21 mg. per cent, and for 54 individuals with caries was 0.17 mg. per cent. No statistical significance can be attached to the difference, nor could any correlation be found between ascorbic acid content and age, or the number of carious surfaces.

The Chemical Nature of the Proteins from Human Enamel. F. L. Losee and W. C. Hess.

Enamel from human, freshly extracted, noncarious erupted permanent molars, has been divided into: cuticle, enamel proper, and total enamel comprising both cuticle and enamel proper. Proteins have been isolated from these three divisions. The amino acids cystine, methionine, and phenylalanine were found in the three proteins.

Comparative Protein Chemistry: The Composition of the Proteins of Human Teeth and Fish Scales. Richard J. Block, M. K. Horwitt, and Diana Bolling.

Human dental enamel appears to be a eukeratin. Herring scales contain two groups of proteins: the one has the physical and chemical properties of gelatin and is very similar to human dentin; the other (ichthylepidin) is not soluble in boiling water and may be classified as a collagen-like protein. The relationships between the embryological and chemical findings are discussed.

Decalcification of Bone and Teeth Under Vacuum —A Rapid Method for Producing Hard Tissue Preparations. Jens Waerhaug.

The time required for decalcification of histologic specimens must be considered a problem of great importance. By performing the decalcification under vacuum it has been possible to reduce the time required for this process to one-tenth. The rate of the process is proportional to the vacuum, and for that reason a rather high degree of vacuum is recommended (about 74 cm. of mercury). If the water pressure is sufficiently high a vacuum pump fixed to the water tap can be used. It must be constructed with a valve in order to prevent water from flowing back into the acid bottles.

The quality of the slides obtained in this way is usually better. No disadvantages have been observed after using the method for six months.

The Caries Problem of the School Child. Kenneth A. Easlick, Am. J. Pub. Health, 39:983, August 1949.

In this article Doctor Easlick has suggested that if individual operators were to stop and think a bit about just what contribution dentistry can make toward the child's health, he would readily see that the profession has a very extensive and expensive health service to offer.

He specifically points out that dentists do know the cause of dental caries. However, over one-half of 61 pamphlets appraised by graduate students at the University of Michigan indicate that we do not know what causes tooth decay. For the benefit of uninformed, health-minded individuals, the definition of dental caries, as accepted at the Michigan Workshop in 1946, should be widely publicized.

To have a better concept of how dental caries may be controlled, every dentist should be familiar with the six factors listed in this article as essential for dental care. With these factors in mind one readily can see that we have some individuals naturally immune to dental caries and that some enamel, especially that treated with certain chemicals such as sodium fluoride, may become less soluble in weak acids.

A number of micro-organisms, especially the lactobacilli found in the mouth, are capable of producing acids that are strong enough to decalcify enamel. By eliminating or reducing these micro-organisms, dental caries may be controlled. On the other hand, bacterial plaques may prevent the saliva from acting more specifically as a buffering agent. By the use of certain chemicals such as the ammonia nitrogen products, or withholding certain foods upon which these bacteria thrive, caries may also be controlled. Perhaps it will be possible within the near future to add some agent to commercial sugar that will interrupt the enzyme action on carbohydrates to help in the eradication of dental caries.

From the vast amount of valuable scientific information concentrated into this short article, the dental profession can readily visualize the responsibility that will continuously be thrust upon it to help improve the dental health of the school child.—*John E. Christzberg.*

Standards of Dental Care for the Different Age Groups. Allen O. Gruebbel, Am. J. Pub. Health, 39:979, August 1949.

Treatment measures used in dentistry probably have changed more rapidly than those in any other health profession during the last few years. This change has been caused by the profession's interest in biological science —from mechanical repair to prevention. With the development of new methods to prevent or control oral pathology and defects, no standard or specific formula for dental care can be adopted.

In laying the groundwork to justify minimum standards of dental care for children, as formulated by the American Society of Dentistry for Children, Doctor Gruebbel offers definitions for oral health and oral ill-health. To bring the standards up-to-date, he believes the Society of Dentistry for Children would accept the topical application of sodium fluoride as an addition to the list.

Since it is not practical to provide immediate minimal dental services for all children, Doctor Gruebbel suggests that it might be well to consider the proposal to make available the most essential dental services listed by Dr. Norman F. Gerrie in a paper presented at the 1946 meeting of the American Public Health Association. He also suggests that the topical application of sodium fluoride be added to this list.

The desired dental care standard for adults is one of extensive services. It appears logical that the services that promote health and restore function should be sacrificed last. Doctor Gruebbel states that "a lowering of these standards must inevitably result in a lower level of oral health." This can mean that we need more dentists to supply optimal dental care for all, and until we have an adequate number of dentists, services must be limited to the most essential.—*John E. Christzberg.*

DEATHS

Allison, Walter J., Wesleyville, Pa.; School of Dentistry, University of Pittsburgh, 1911; died September 22; aged 69.

Ambrose, A. T., Redlands, Calif.; died September 28; aged 93.

Amer, William N., Lancaster, Pa.; died September 20; aged 66.

Barber, J. Max, Philadelphia; School of Dentistry, Temple University, 1912; died in September; aged 74.

Bartlett, Herbert A., Concord, N. H.; Boston Dental College, 1898; died October 14; aged 74.

Bell, Chadz B., Antioch, Ill.; died August 3.

Bennett, Clarence A., Denver; School of Dentistry, University of Denver, 1900; died October 10; aged 75.

Blumenkrantz, Moses, New York; College of Dentistry, New York University, 1912; died September 10.

Bodfish, S. Burr, Lansing, Mich.; Dental School, Northwestern University, 1924; died October 20; aged 60.

Bogie, William H., Vincennes, Ind.; Chicago College of Dental Surgery, 1902; died October 22; aged 77.

Bohlender, Auta N., Cincinnati; Ohio College of Dental Surgery, University of Cincinnati, 1901; died September 22; aged 77.

Borland, John H., Lincoln, Neb.; died September 26; aged 95.

Boyer, Earl H., Chicago; Chicago College of Dental Surgery, 1927; died August 22; aged 51.

Brown, Donald F., Caledonia, N. Y.; School of Dentistry, University of Buffalo, 1939; died October 18; aged 37.

Callaway, Shirley M., Huntington, W. Va.; Baltimore College of Dental Surgery, University of Maryland, 1910; died September 28; aged 64.

Cartney, Thomas L., Twin Falls, Idaho; College of Dentistry, Creighton University, 1913; died October 23; aged 62.

Casaday, George H., Palo Alto, Calif.; College of Dentistry, University of California, 1900; died July 19.

Chamberlain, Clifton H., Marlin, Texas; Atlanta Dental College, 1914; died October 9; aged 60.

Chesterson, Clifford C., St. Louis; School of Dentistry, St. Louis University, 1917; died October 1; aged 64.

Child, Harry B., Beverly Hills, Calif.; College of Dentistry, University of Minnesota, 1901; died October 12; aged 70.

Clifford, Gerald P., Portland, Me.; Dental School, Tufts College, 1907; died October 10; aged 64.

Cole, Wesley H., New York; College of Dental and Oral Surgery of New York, 1905; died October 23; aged 66.

Cordick, Charles H., Chicago; School of Dentistry, University of Pennsylvania, 1905; died October 22; aged 72.

Covalt, Clifford A., Oakland, Calif.; died October 11; aged 78.

Craig, James R., Almont, Mich.; Department of Dental Surgery, Detroit College of Medicine, 1902; died September 23; aged 69.

Cupitt, Howard E., Germantown, Pa.; Medico Chirurgical College of Philadelphia, 1902; died October 5; aged 71.

Diamond, Moses, New York; New York College of Dentistry, 1914; died October 6; aged 55.

Dickson, William D., Wampum, Pa.; died October 8; aged 58.

Donahoe, Harry E., Los Angeles; Chicago College of Dental Surgery, 1905; died October 9; aged 65.

Duzik, John L., Hollywood, Calif.; College of Dentistry, University of Southern California, 1939; died October 30; aged 34.

Emmert, Carl S., Cleveland; Indiana Dental College, 1911; died October 19; aged 63.

Fauerbach, Frederick W., Madison, Wis.; Dental School, Northwestern University, 1918; died July 7.

Ferreby, Thomas G., Humboldt, Iowa, College of Dentistry, University of Iowa, 1896; died September 23; aged 81.

Finney, John H., Coral Gables, Fla; College of Dentistry, New York University, 1896; died September 16.

Gans, William D., Cleveland; died October 7; aged 76.

Getman, Blanche J., Davenport, Iowa; College of Dentistry, University of Iowa, 1916; died October 21; aged 62.

Gibson, James C., Wilmington, Calif.; Chicago College of Dental Surgery, 1900; died October 14; aged 72.

Gibson, Obe E., Platteville, Wis.; Chicago College of Dental Surgery, 1890; died September 23; aged 84.

Giere, Glenn A., Tucson, Ariz.; College of Dentistry, University of Minnesota, 1932; died October 17; aged 46.

Graesle, Albert B., Washington, D. C.; School of Dentistry, Georgetown University, 1915; died October 12; aged 68.

DIRECTORY

Officers

Philip E. Adams, President.....106 Marlborough St., Boston
Harold W. Oppice, President-Elect.....1002 W. Wilson Ave., Chicago
Bernerd C. Kingsbury, First Vice-President.....490 Post St., San Francisco
Don M. Hamm, Second Vice-President.....White Bldg., Clarksville, Ark.
Gerald G. Burns, Third Vice-President.....133 Clinton Ave., South, Rochester, N. Y.
Percy T. Phillips, Speaker, House of Delegates.....18 E. 48th St., New York
Harold Hillenbrand, Secretary.....222 E. Superior St., Chicago
C. Willard Camalier, Assistant Secretary.....1726 Eye St., N.W., Washington, D. C.
H. B. Washburn, Treasurer.....Lowry Medical Arts Bldg., St. Paul

Board of Trustees

J. B. Carr, 1952, Seventh District.....Hume Mansur Bldg., Indianapolis
C. S. Foster, 1952, Tenth District.....Dows Bldg., Cedar Rapids, Iowa
Charles I. Taggart, 1952, First District.....139 Bank St., Burlington, Vt.
Robert P. Thomas, 1952, Sixth District.....Francis Bldg., Louisville, Ky.
William McGill Burns, 1951, Second District.....80 Hanson Place, Brooklyn
R. C. Dalgleish, 1951, Thirteenth District.....State Capitol, Salt Lake City
Willard Ogle, 1951, Twelfth District.....310 N. Ervay St., Dallas, Texas
Fred S. Shandley, 1951, Eleventh District.....Medical & Dental Bldg., Seattle
LeRoy M. Ennis, 1950, Third District.....4001 Spruce St., Philadelphia
L. H. Jacob, 1950, Eighth District.....Jefferson Bldg., Peoria, Ill.
James E. John, Sr., 1950, Fifth District.....Medical Arts Bldg., Roanoke, Va.
Daniel F. Lynch, 1950, Fourth District.....1678 Primrose Road, N.W., Washington, D. C.
Obed H. Moen, 1950, Ninth District.....Watertown, Wis.

Bureaus

Chemistry: J. Roy Doty, Director, 222 E. Superior St., Chicago.
Economic Research and Statistics: B. D. Moen, Assistant Director, 222 E. Superior St., Chicago.
Library and Indexing Service: Donald A. Washburn, Director, 222 E. Superior St., Chicago.
Public Information: Herbert B. Bain, Director, 222 E. Superior St., Chicago.

Councils

Constitution and Bylaws: Max E. Ernst, Chm., Lowry Medical Arts Bldg., St. Paul.
Dental Education: R. W. McNulty, Chm., 1757 W. Harrison St., Chicago; Shailer A. Peterson, Secy., 222 E. Superior St., Chicago.
Dental Health: Leo J. Schoeny, Chm., Maison Blanche Bldg., New Orleans; Allen O. Gruebbel, Secy., 222 E. Superior St., Chicago.
Dental Museum and Registry: Henry A. Swanson, Chm., 1726 Eye St., N. W., Washington, D. C.
Dental Research: J. L. T. Appleton, Chm., 4001 Spruce St., Philadelphia; C. B. Hall, Secy., 1835 Eye St., N. W., Washington, D. C.
Dental Therapeutics: Thomas J. Hill, Chm., 2085 Adelbert Road, Cleveland; J. Roy Doty, Secy., 222 E. Superior St., Chicago.
Dental Trade and Laboratory Relations: F. W. Herbine, Chm., 230 N. Fifth St., Reading, Pa.; Earl M. Eaton, Secy., American Trust Bldg., Cedar Rapids, Iowa.
Federal Government Dental Services: R. H. Friedrich, Chm., 960 Park Ave., Plainfield, N. J.
History: L. W. Johnston, Chm., Republic Bldg., Denver.
Hospital Dental Service: Edward C. Dobbs, Chm., 618 W. Lombard St., Baltimore.
Insurance: L. D. Cleek, Chm., Medical Arts Bldg., Charleston, W. Va.; Paul W. Zillmann, Secy., 29 Walden Ave., Buffalo.
International Relations: Stanley D. Tylman, Chm., 55 E. Washington St., Chicago.
Journalism: Charles A. Wilkie, Chm., 1 Hanson Place, Brooklyn.
Judicial Council: Ernest G. Sloman, Chm., 344 14th St., San Francisco.

Legislation: E. Harold Gale, Chm., 142 Washington Ave., Albany, N. Y.; Francis J. Garvey, Secy., 222 E. Superior St., Chicago.
Membership: H. C. Jarvis, Chm., Mercantile Library Bldg., Cincinnati.
National Board of Dental Examiners: Walter H. Wright, Chm., 209 E. 23rd St., N. Y.; Gordon L. Teall, Secy., P. O. Box 71, Hiawatha, Kan.
Relief: John S. Owens, Chm., 407 Cooper St., Camden, N. J.
Scientific Session: William A. Garrett, Chm., Candler Bldg., Atlanta Ga.; Robert G. Kesel, Secy., 808 South Wood St., Chicago.

Advisory Committees

Bureau of Chemistry: Philip Jay, Chm., 715 S. Forest Ave., Ann Arbor, Mich.
Bureau of Economic Research and Statistics: L. M. FitzGerald, Chm., Roshek Bldg., Dubuque, Iowa.
Bureau of Library and Indexing Service: John E. Gurley, Chm., 350 Post St., San Francisco.
Bureau of Public Information: C. H. Jamieson, Chm., David Whitney Bldg., Detroit.

Section Chairmen

Clinics:
Full Denture Prosthesis:
Hospital Dental Service:
Operative Dentistry: O. B. Coomer, Heyburn Bldg., Louisville, Ky.
Oral Surgery: Vernor H. Eman, 622 Medical Arts Bldg., Grand Rapids 2, Mich.
Orthodontics:
Partial Denture Prosthesis: Lewis W. Thom, 1546 Medical Arts Bldg., Minneapolis 2.
Pedodontics and Oral Hygiene: John E. Chrietzberg, 222½ S. Fourth St., Springfield, Ill.
Periodontia: Harold G. Ray, College of Dentistry, University of California, San Francisco 22.
Practice Management: Lloyd H. Dodd, 860 Citizens Bldg., Decatur 30, Ill.
Research: Francis Arnold, National Institute of Health, Bethesda, Md.
Roentgenology:
Scientific Exhibits (Dental Health Education Exhibits and Motion Pictures):

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois
WHitehall 4-6730 Cable Address: ADAECO

Lon W. Morrey, Editor John J. Hollister, Business Manager

All expressions of opinions and all statements of supposed facts are published on the authority of the writer over whose signature they appear, and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association. *Articles* are accepted with the understanding that they have not been published previously and that they are submitted solely to THE JOURNAL. *Advertising:* All products coming within the scope of the Council on Dental Therapeutics of the American Dental Association must be acceptable to the Council in order to be advertised in THE JOURNAL. Subscription is included in the annual membership dues of the American Dental Association. The subscription rate is $7 a year payable in advance for domestic subscriptions and $8 a year for foreign subscriptions. *Notice of change of address* should be received one month before the change is to be effective. Orders for reprints of JOURNAL articles must be received by the Business Manager's Office not later than the 15th of the month of issue in order to secure advantage of the lowest possible prices. Orders received after this date are subject to special quotation.

ANNOUNCEMENTS

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	May 1-3	Biloxi, Miss.	G. W. Matthews	1922 Tenth Ave., S., Birmingham 5
Arizona	April 20-22	Grand Canyon	H. G. DeWolf	Valley National Bank Bldg., Tucson
Arkansas	April 2-5	Little Rock	D. M. Hamm	White Bldg., Clarksville
California	April 24-26	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California	April 3-5	Los Angeles	M. E. Ralston	Medico-Dental Bldg., Pomona
Colorado	Oct. 4-7	Colorado Springs	R. A. Downs	724 Republic Bldg., Denver 2
Connecticut	May 22-24	Hartford	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Jan. 11	Wilmington	Norbert Gladnick	1009 Madison St., Wilmington
D. of Columbia	Mar. 12-15	Washington	K. H. Wood	202-1835 Eye St., N. W., Washington
Florida			L. M. Schulstad	Professional Bldg., Bradenton
Georgia			J. M. Heard, Jr.	Persons Bldg., Macon
Hawaii	Oct. 12-14	Honolulu	J. H. Dawe	P. O. Box 39, Honolulu 10
Idaho	June 26-28	McCall	A. R. Cutler	Eastman Bldg., Boise
Illinois	May 8-11	Springfield	P. W. Clopper	623 Jefferson Bldg., Peoria 2
Indiana	May 15-17	Indianapolis	E. E. Eubank	Kingman
Iowa	May 1-3	Des Moines	H. I. Wilson	639 Insurance Exchange, Des Moines
Kansas	May 7-10	Kansas City, Mo.	F. A. Richmond	1008 Huron Bldg., Kansas City
Kentucky	Mar. 29-31	Louisville	A. B. Coxwell	1976 Douglass Blvd., Louisville
Louisiana	April 14-16	Monroe	J. S. Bernhard	407 Medical Arts. Bldg., Shreveport
Maine	June 22-24		F. P. Gilley	31 Central St., Bangor
Maryland	May 1-3	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore 1
Massachusetts	May 1-4	Boston	A. M. Bommer	349 Broadway, Revere
Michigan	April 24-26	Detroit	F. Werthelmer	Michigan Dept. of Health, Lansing
Minnesota	Feb. 20-22	St. Paul	C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi	June 18-21	Biloxi	F. C. Sneed	Osyka
Missouri	May 7-10	Kansas City	R. R. Rhoades	201 Merchants Bank Bldg., Jefferson City
Montana	May 4-7	Helena	C. S. Renouard	304 Phoenix Bldg., Butte
Nebraska	May 8-10	Omaha	F. A. Pierson	Federal Securities Bldg., Lincoln
Nevada	May 8-9	Las Vegas	C. A. Palce	Boggs Bldg., Las Vegas
New Hampshire	June 18-20	Bretton Woods	F. E. Williams	814 Elm St., Manchester
New Jersey	April 26-28	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	May 22-24	Albuquerque	J. S. Eilar	First National Bank Bldg., Albuquerque
New York	June 5-8	New York	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 18-20	Pinehurst	R. F. Hunt	Rose Drug Co., Bldg., Rocky Mount
North Dakota	May 7-10	Fargo	A. L. Smeby	Northwood
Ohio	Nov. 27-29	Cincinnati	E. G. Jones	185 E. State St., Columbus
Oklahoma	April 16-19	Tulsa	F. H. Binkley	Hennessey
Oregon	Mar. 6-8	Portland	H. C. Fixott, Jr.	Medical Dental Bldg., Portland
Panama Canal Zone			R. O. Leon	Box 1094, Ancon
Pennsylvania	Oct. 28	Atlantic City, N. J.	M. B. Zimmerman	217 State St., Harrisburg
Puerto Rico	Jan. 26-29	San Juan	F. Guerra	Avenida Ponce de Leon, Santurce
Rhode Island	Jan. 17-18	Providence	J. F. Colgan	838 Newport Ave., Pawtucket
South Carolina	May 7-9	Columbia	J. R. Owings	201 E. North St., Greenville
South Dakota	May 14-16	Huron	E. W. Elmen	Sioux Falls
Tennessee	May 10-12	Chattanooga	E. J. Justis	Exchange Bldg., Memphis
Texas	April 23-27	Dallas	W. Ogle	310 N. Ervay St., Dallas
Utah	May 15-17	Salt Lake City	B. F. McBride	Medical Arts Bldg., Salt Lake City
Vermont	May 22-24	Woodstock	J. A. Larrow	Middlebury
Virginia	April 17-19	Roanoke	J. E. John	804 Medical Arts Bldg., Roanoke
Washington	May 22-24	Spokane	F. J. Dingler	1502 Medical-Dental Bldg., Seattle 1
West Virginia	May 15-17	Huntington	A. B. Drake	Huntington
Wisconsin	April 11-13	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming	June 22-24	Cheyenne	T. A. Ward	326 Wyoming National Bank Bldg., Casper

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Arkansas	June 19-22*	Little Rock	H. E. Hanna Secy.	Wilson Bldg., El Dorado
California	Jan. 30 June 12 July 24	San Francisco Los Angeles San Francisco	K. I. Nesbitt	507 Polk St., San Francisco 2
Hawaii	Feb., Aug.*	Honolulu	H. L. Houvener	7-8 Pantheon Bldg., Honolulu
Iowa	June 5-9	Iowa City	H. M. Willits	719 Roshek Bldg., Dubuque
Michigan	Jan. 29-Feb. 4 June 11-June 17	Ann Arbor	J. L. Champagne	3714 W. McNichols Road, Detroit 21
Minnesota	Jan. 9-14	Minneapolis	F. A. Larson	1632 Washington St., N. E. Minneapolis
New Jersey	June 5-9† June 5-6‡		W. A. Wilson	150 E. State St., Trenton 8
Oregon	June 19-22*	Portland	A. F. Davis, Exec. Secy.	306 Public Service Bldg., Portland
Virginia	June 13	Richmond	J. M. Hughes	715 Medical Arts Bldg., Richmond 19
Wisconsin	June 12-16	Milwaukee	S. F. Donovan	Tomah

*Dentistry and dental hygiene.
†Dentistry.
‡Dental Hygiene.

OTHER MEETINGS

Name	Date	City	Secy. or Chm.	Address
Academy of Denture Prosthetics	May 1-7	Milwaukee	I. L. Furnas Secy.	La Jolla, Calif.
American Association of Dental Schools	Mar. 27-31†	French Lick Springs, Ind.	J. E. Buhler Secy.	School of Dentistry, Emory University, Atlanta 3, Ga.
American Association of Endodontists,	Feb. 4-5	Chicago	N. W. Burkman Secy.	525 Merrill St., Birmingham, Mich.
Annual Meeting American Board of Orthodontics	May 4-7	Chicago	S. C. Hopkins Secy.	1726 Eye St., N. W., Washington, D. C.
American Board of Prosthodontics	Jan. 29-Feb. 4*		I. R. Hardy Secy.	Tufts Dental College, 136 Harrison Ave., Boston
American Dental Society of Europe	July 19-22	Amsterdam, Holland	F. D. Derrick	140 Park Lane, London, W. 1.
American Denture Society	Feb. 4-5	Chicago	S. W. Cotter Secy.	11059 Hale Ave., Chicago
California State Dental Association, First Annual Meeting, Children's Dental Health Conference	Feb. 6	San Francisco	L. W. Schmohl, Jr. Gen. Chm.	450 Sutter Bldg., San Francisco
Chicago Dental Society Midwinter Meeting	Feb. 6-9	Chicago	E. W. Baumann Secy.	30 N. Michigan Ave., Chicago
Cleveland Dental Society, Tenth Annual Children's Dental Health Day Meeting	Feb. 6	Cleveland	L. Greulich Exec. Secy.	710 Carnegie Hall Bldg., Cleveland 15
District of Columbia Dental Society Annual Postgraduate Clinic	Mar. 12-15	Washington	W. Holland Exec. Secy.	1835 Eye St., N. W. Washington, D. C.
Greater Philadelphia Annual Meeting	Feb. 1-3	Philadelphia	R. Adams Secy.	710 W. York St., Philadelphia
New York University College of Dentistry, Silver Anniversary	April 14	New York	Sidney Sorrin Chm.	New York University Alumni Office 22 Washington Square, North, New York 11
Rocky Mountain Midwinter Dental Meeting	Jan. 8-11	Denver	G. H. Siersma Secy.	724 Republic Bldg., Denver 2

*Examinations for certification.
†General sessions March 27-29; research meetings March 29-31.

Name	Date	City	Secy. or Chm.	Address
Southeastern Society of Oral Surgeons, First Annual Meeting	Mar. 17-18	Atlanta, Ga.	G. W. Matthews Editor	1922 Tenth Ave., S. Birmingham, Ala.
Southwestern Society of Orthodontists	Feb. 12-15	Houston, Tex.	M. A. Flesher Secy.	Medical Arts Bldg., Oklahoma City
Temple Dental Alumni, Annual Meeting	May 9, 10	Philadelphia	A. L. Borish	255 S. 17th St., Philadelphia 3
Thomas P. Hinman Mid-Winter Clinic, Thirty-Eighth Annual Meeting	Mar. 19-22	Atlanta, Ga.	S. L. Davis Gen. Chm.	932 Candler Bldg., Atlanta, Ga.
University of Kansas City, School of Dentistry, Kansas City-Western Dental College, Alumni Annual Meeting	Mar 20, 21	Kansas City, Mo.	H. H. Dukes Chm. Publicity Committee	New Brotherhood Bldg., Kansas City, Kan.
University of Pennsylvania, Dental Alumni Society	Jan. 31	Philadelphia	J. P. Lobby Chm. Publicity Committee	Thomas W. Evans Museum and Dental Institute, School of Dentistry, University of Pennsylvania, Philadelphia 4
University of Toronto, Faculty of Dentistry, Continuation Course in Operative Dentistry	Feb. 13-17	Toronto	R. G. Ellis Dean	Faculty of Dentistry, University of Toronto, 230 College St., Toronto, Ontario, Canada

—Cleans—Quickly, Efficiently

—Cool, Minty Flavor

—Leaves the Mouth Feeling Clean and Refreshed

—Recommended and Used for Years by
Discriminating Dentists, all over the World

—Samples on request

WHITEHALL PHARMACAL COMPANY • 22 East 40th Street, New York 16, N. Y.

Steele's SIQVELAND Formatrix

(PATENTED)

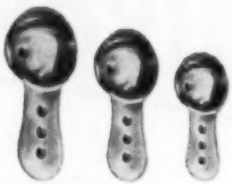
For use in acrylic and synthetic filling work...

Indispensable for making gingival restorations.

Steele's **FORMATRIX** provdes a simple and positive method for filling cavities with plastic filling materials.

The filling material is inserted under constant, sustained pressure with air and moisture excluded and the normal contour of the tooth is restored without manipulation.

TRAY HELD IN PLACE ON TOOTH WITH CLAMP



LARGE MEDIUM SMALL

TRAYS FOR TAKING IMPRESSION

COMPLETE OUTFIT CONSISTING OF CLAMP AND 24 ASSORTED TRAYS—$4.00 AVAILABLE AT YOUR DEALER'S

THE COLUMBUS DENTAL MANUFACTURING COMPANY
COLUMBUS 6, OHIO

GENERAL ELECTRIC *Announces...*

A NEW STERILIZING OIL

CLEANS AND LUBRICATES AS IT STERILIZES

Offers many advantages

General Electric research has developed a successful formulation of a new type of sterilizing oil which offers dentists important advantages.

The product has been thoroughly tested, both in the laboratory and through actual use in several hundred dental offices. Dentists who have tried the new oil report that it eliminates many of the nuisances associated with the use of petroleum oil and water as sterilizing media.

G-E sterilizing oil is crystal-clear, odorless, non-fuming, and non-inflammable at sterilizing temperatures. It actually lubricates and cleans as it sterilizes.

G-E sterilizing oil is clean to use. It eliminates sludge in the sterilizer. Moreover, since it also eliminates fumes, there is no discoloration of office walls, or unpleasant odor distasteful to patient and dentist alike.

INSTRUMENTS LAST LONGER

The use of G-E dental sterilizing oil will give your instruments longer life, make it unnecessary to take instruments apart for cleaning and lubricating, eliminate corrosion and thereby reduce your maintenance costs.

SEE YOUR DENTAL DEALER

Try this new oil yourself. Check its many benefits. For the name of the dealer in your area who sells G-E Dental Sterilizing Oil, write to Section 56-12, Chemical Department, General Electric Company, Pittsfield, Mass. Available in Canada through Canadian General Electric, Toronto.

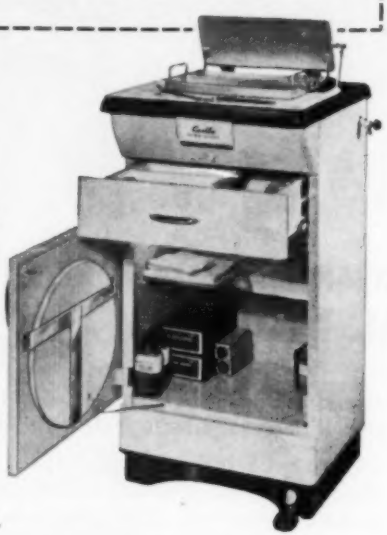
You can put your confidence in

GENERAL ELECTRIC

CD49-QA

Add New Convenience—
New Beauty To Your Office

With the NEW
Castle
"SPACE-MAKER"
Sterilizer



If you have been putting up with a "before the war" sterilizer you will be amazed at the convenience, utility and beauty of the new Castle "Space-Maker" Sterilizer.

Here's the postwar sterilizer, designed to give you efficiency, convenience and a beauty that enhances the appearance of any office.

The thirteen major features of the "Space-Maker" listed here indicate the advances Castle has made in Sterilizers. Your Castle Dealer will show you many more time and effort saving advantages.

See how these features of Castle "*Space-Maker*" Sterilizer can help you

1. Extra space on the table-top (much more than any other single-cabinet model.) Room for sterilizer tray, *and* instrument tray, with ample working space for instruments.
2. Sterilizer with cast bronze cover that conserves water and is easy to keep shining bright; Castle's famous tin-coated cast bronze boiler; "Full-Automatic" operation with low water cut-off, two heating units, no moving parts.
3. Deep duplex drawer, working smoothly on quiet roller bearings.
4. Rack for two trays (boilable porcelain trays furnished).
5. Built-in rack for small bottles.
6. Extra room for instruments beneath the racks.
7. Pilot light visible anywhere in the room.
8. Full-width, quiet cabinet door.
9. Rack for bracket table covers.
10. Roomy cabinet automatically lighted when door opens.
11. Plate glass shelf leaves space for tall receptacles.
12. Cast aluminum base (with toe recess) won't leave marks on floor.
13. Foot-lift with oil check action . . . smooth and quiet.

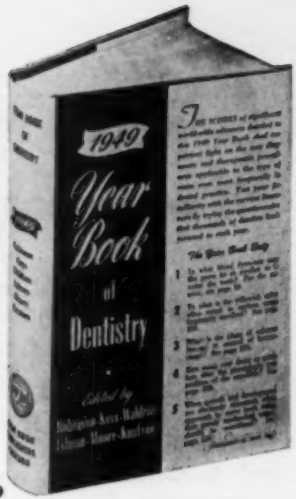
Get in touch with your dealer or write Wilmot Castle Co., 1104 University Ave., Rochester 7, N. Y.

Castle LIGHTS AND STERILIZERS

Order Now the

NEW 1949 YEAR BOOK of DENTISTRY

for really worthwhile guidance in using latest practice advances



Edited by

Robinson, Keys, Waldron, Tylman, Moore and Knutson

In 656 pages, with 406 illustrations, the editors of the New 1949 Year Book of Dentistry give you the most comprehensive and practical coverage of applied advances in dental practice to be had anywhere in the literature. All under one cover, and with greatest economy, you get the new things of today, the trends for tomorrow, including 339 new or improved diagnostic and therapeutic measures relating to 156 dental disorders. Fine as previous years' volumes were, the New 1949 volume eclipses all because it has been newly organized, enhanced by many features and made distinctly more useful and more practical. There are 15,000 words alone of clinical comment and evaluation by the editors. Order now while copies are still available.

Edited by Hamilton B. G. Robinson, D.D.S., Donald A. Keys, D.D.S., Carl W. Waldron, M.D., D.D.S., Stanley D. Tylman, D.D.S., George R. Moore, D.D.S., and John W. Knutson, D.D.S. 656 pages, 406 illustrations.

$5.00 Postpaid

YEAR BOOK PUBLISHERS, INC., 200 E. ILLINOIS ST., CHICAGO 11, ILL.

Please send me, postpaid, for 10 days' free examination.

☐ New 1949 Year Book of Dentistry.....$5.00

Name.....Street.....

City.....Zone.....State.....

J.A.D.A. 1-50

why not . . .

You are cautioned not to contact ordinary acrylic teeth with alcohol. Why not pass this caution along to your patient? If *you* can harm the teeth with alcohol so can your patient.

No such caution is necessary with Dura-Blend.

Dura-Blend will not craze in processing or in use by any patients, including diabetic patients and persons who take their drinks "straight".

Dura-Blend has a 100% safety factor against heat, solvent attack and wear.

Write for booklet on testing plastic teeth.

it's

SPECIFIC GRAVITY 8.23

to a testing laboratory

but it means **PATIENT COMFORT** *to you*

To a testing laboratory, Durallium's remarkable strength-weight ratio is merely a set of figures reading, "specific gravity 8.23, tensile strength 112,200 pounds per square inch."

To *you*, Durallium, outstanding chrome-cobalt alloy, means lightweight, non-bulky restorations for maximum patient comfort . . . possibilities for improved design . . . maintenance of original fit . . . and resistance to the stresses and strains of mastication and repeated removals and reinsertions.

Durallium offers physical characteristics that pass the ordeals of *both* testing machines and long-term clinical use.

available through your qualified Durallium laboratory
consult your classified telephone directory

DURALLIUM *products corp.* ESTABLISHED 1936

225 NORTH WABASH AVENUE • CHICAGO 1, ILLINOIS

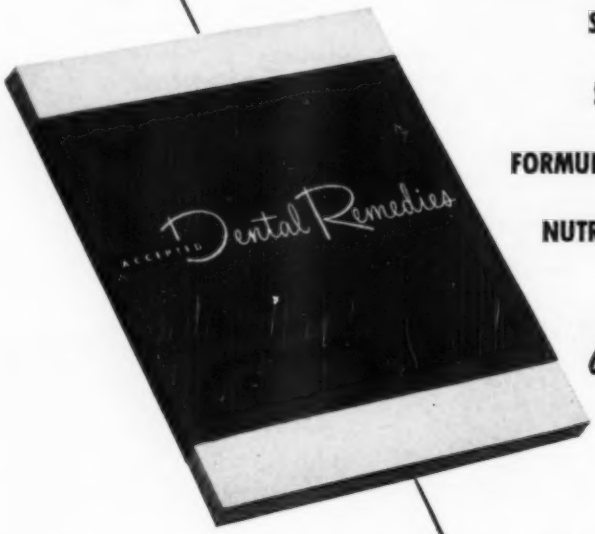
Dental Remedies

NEW FEATURES

- BASIC INFORMATION ON AUREOMYCIN AND TYROTHRICIN....NEW DISINFECTING AGENTS

IMPORTANT REVISIONS

- STREPTOMYCIN
- SUGGESTIONS
- FORMULA AND PRESCRIBING
- NUTRITIONAL FACTORS



Available Now at only $1.50

SEND YOUR ORDER TODAY TO:

AMERICAN DENTAL ASSOCIATION
222 E. SUPERIOR ST. · CHICAGO 11, ILL.

ada

good laboratories

do their
best work
with
LUCITONE

Continuing improvements in laboratory technic . . . and in the performance of *Lucitone*, the denture material preferred by leading laboratories . . . are of tremendous value to the dental profession and to denture patients everywhere. In lifelike appearance, in tissue tolerance, and in dimensional stability, today's *Lucitone* dentures set new standards in prosthetic excellence.

you're sure when you specify

LUCITONE

REG. U. S. PAT. OFF.

For modern materials call on *Caulk* Milford, Delaware

LOOK TO *Austenal*

FOR PRODUCTS AND TECHNIQUES

STRENGTH

MICROMOLD

MICROMOLD TEETH

A PRODUCT OF AUSTENAL RESEARCH

ARE THE STRONGEST PORCELAIN TEETH AVAILABLE TO THE DENTAL PROFESSION TODAY

AR

PRESCRIBE MICROMOLD TEETH THROUGH

ENHANCE YOUR PRACTICE WITH MICROMOLD TEETH AND OTHER PRODUCTS OF AUSTENAL RESEARCH

Research...

THAT INSURE CHAIRTIME CONSERVATION

VITALLIUM—The original and *best* cobalt-chromium alloy

MICROMOLD TEETH—Natural tooth reproductions in both porcelain and plastic.

MICROCAST PROCESS—A precision casting technique for Vitallium.

VITALON—A methyl-methacrylate complying with A.D.A. specification No. 12.

FLEXSEAL PATTERNS—Pre-formed precision plastic patterns.

MICRO-DENTURE PROCEDURE—An improved full denture procedure.

EQUI-POISE—The application of physics and engineering principles to the design of cast partial dentures.

MOSKEY DENTURES—Custom-built plastic reproductions.

MICROMOLD ARCHES—Pre-formed plastic functional set-ups.

AUSTALON—An original vinyl-ethenoid resin development.

YOUR AUSTENAL DISTRIBUTOR

® Trademarks registered U.S. Pat. Off.

PRESCRIBE THROUGH YOUR VITALLIUM DISTRIBUTOR . . . ever alert to YOUR PROSTHETIC NEEDS.

COMPLIES WITH A.D.A. SPECIFICATION NO. 9

A PRODUCT OF
PFINGST & CO., INC., 62 COOPER SQ., NEW YORK 3, N. Y.

Visit the Pfingst Booth No. 187 at the Chicago Mid-Winter Meeting

1,001 uses at the chair...

Have a box of these small, white sheets of soft, strong absorbent cellulose tissue—in convenient dispensing box—near your chair, always. They're ideal for removing gum or lipstick, for wiping instruments, etc. Try them once, you'll never be without them!

Two sizes: 5" x 6", 5" x 9"
100 of a size to a box.

Cellulose Mouth Wipes

Johnson & Johnson

DENTAL DIVISION

for better amalgam restorations

These handy cloths stand up under heavy pressure, leaving no shreds or foreign matter in filling mass. Prevents skin moisture and secretions from combining with alloy. Diameter 2⅞", 100 in a box.

Johnson & Johnson

DENTAL DIVISION

AMALGAM SQUEEZE CLOTHS

Easy Way to Disinfect Instruments *Chemically*

• No boiling of water • No waiting for instruments to cool • No danger of skin irritation (may be used as a hand rinse) *with*

PARKER'S *Germicidal* TABLETS

JUST TWO SIMPLE STEPS:

Drop 1 tablet into a pint of water — forming a 1:1000 solution

Remove instruments — ready for use — in fifteen minutes

- Stable • Noncorrosive
- No antirust tablets required
- No special equipment needed
- High margin of safety

Accepted Council on Dental Therapeutics American Dental Association

PROVED BACTERICIDAL EFFECTIVENESS

PARKER'S *Germicidal* TABLETS

BRAND OF BENZETHONIUM CHLORIDE

SUPPLIED: Bottles of 40 tablets—sufficient for 5 gallons.

Economically Priced at $5.50

Available Through Your Regular Dealer

A. J. PARKER COMPANY

Pharmaceutical Chemists

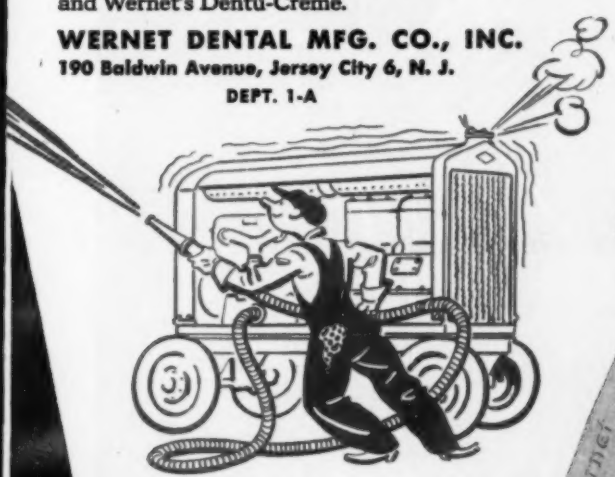
PHILADELPHIA 3, PENNA.

SANDBLAST A
WERNET'S DENTU-CREME AND

Ming Vase?

Priceless ancient pottery calls for careful cleaning, lest the beautiful surface finish be irreparably damaged. • Beautiful dentures, too, can be ruined by the careless use of inappropriate cleansing agents. You can help protect them by suggesting Wernet's Dentu-Creme and Wernet's Plate Brush. • Dentu-Creme is smooth, absolutely non-injurious, and an excellent detergent. The special polishing agent it contains makes it ideal for use on acrylics. • Wernet's Plate Brush, with the Easy Grip Handle, conforms to professional specifications. Its divided tufts of fine bristles are individually wired-in for long life. Its black bristle section is used on the ridge and the vault—its white bristle section on the teeth and interproximal surfaces. • For safe, yet thorough removal of mucin plaques, food particles and stubborn stains, suggest Wernet's Plate Brush and Wernet's Dentu-Creme.

WERNET DENTAL MFG. CO., INC.
190 Baldwin Avenue, Jersey City 6, N. J.
DEPT. 1-A



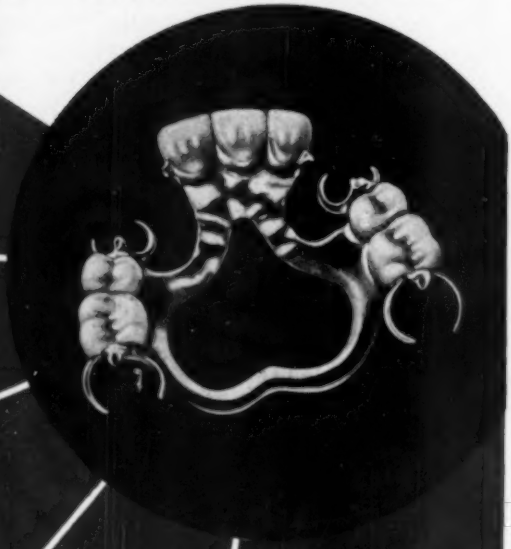
WERNET'S PLATE BRUSH

JELENKO GOLDS

for 1-PIECE & UNIT CASTINGS, CLASPS, BARS, SADDLES, ETC.

JELENKO NO. 7
CAST GOLD
REG. U.S. PAT. OFF.

THE PATRICIAN OF CASTING GOLDS
GOLD COLOR



Sturdicast
REG. U.S. PAT. OFF.

DEPENDABILITY AT A POPULAR PRICE
GOLD COLOR

PALLORO
REG. U.S. PAT. OFF.

A GOOD, POPULAR-PRICED PLATINUM COLOR GOLD

Heat Always Controlled by THERMOTROL

J. F. Jelenko & Co., Inc.
Manufacturers of Dental Golds & Specialties
136 West 52nd Street · New York 19, U.S.A.

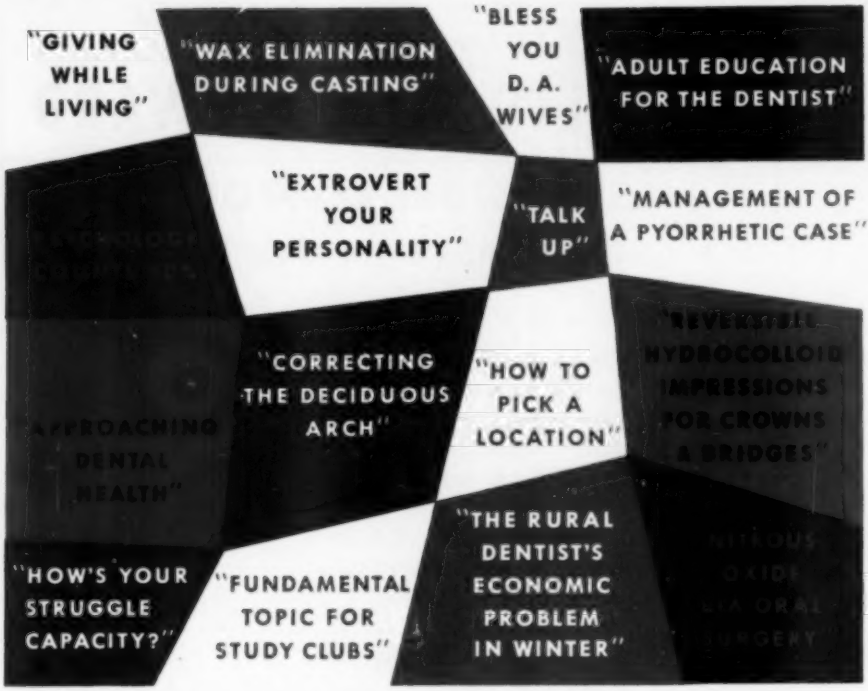
SALES SOAR UPWARD

THE POSTURE COMFORT CHAIR INCREASES IN POPULARITY

More and more dentists are choosing the Posture Comfort Chair to aid them in their daily practice. Relax while you work—"Give Your Back and Feet A Rest." *Order your Posture Comfort Chair NOW!*

CHILDS MANUFACTURING CO.

503-6 BANKERS INSURANCE BLDG. MACON, GEORGIA



Practical, helpful, interesting, and entertaining articles for dentists . . . that's the editorial program for CAL Magazine, the lively, appealing monthly magazine prepared for YOU by the CAL-LAB group and mailed to YOU by the Certified Akers Laboratory near your office. Quoted here are a few of the subject headings taken at random from recent CAL issues. Note their wide range of interest, their specific coverage of your preferred reading material.

SUBSCRIBE today for this popular magazine . . . How? ALL you have to do is to ask your nearest CAL-LAB to put you on the mailing list. How much does it cost? CAL will come to you FREE. It is published as part of the service of your Certified Akers Laboratory. The complete cost to you is the cost of the stamp on your request. And there's no obligation. Better get that letter off today.

the CAL-LAB Group

CERTIFIED AKERS LABORATORIES cal SERVICE

THE SLEDGEHAMMER is a potent weapon . . . just as many "*strong*" anesthetics are potent. But, just as the sledgehammer strikes with shocking impact, such anesthetics may cause irreparable damage to sensitive tissues.

MONOCAINE is—first and foremost—a *safe* local anesthetic. Its action is gentle, free from untoward reactions; tissues return to normal quickly.

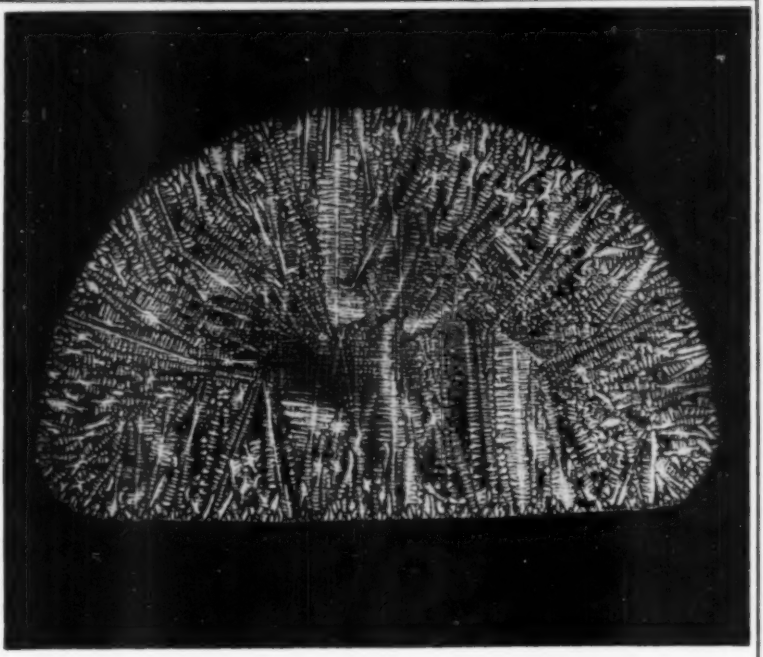
AT THE SAME TIME, Monocaine is potent. It assures freedom from discomfort and pain in all types of operative procedure. More than 250,000,000 Monocaine injections have been made since its introduction in 1937 . . . with safety and satisfaction.

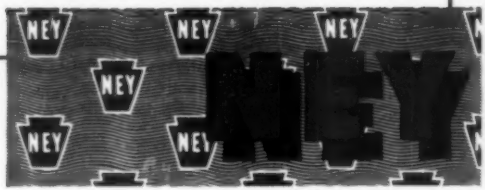
BEWARE sledgehammer anesthesia on your patients. Use Monocaine, the local anesthetic that's *safe* as well as potent!

Monocaine is the registered trade mark of the Novocol Chemical Mfg. Co., Inc.

NOVOCOL CHEMICAL MFG. CO., INC.
501-23 Atlantic Ave. Brooklyn 7, N. Y.

Ask a difficult





question

AND YOU'LL GET A SIMPLE ANSWER !

Today's perfected gold alloys leave little to be desired in simplicity of handling and dependability in use. When trouble occurs it will frequently be due to causes that are not readily apparent, and you may need more than a "curbside" opinion to get you back on the right track.

That is where the Ney Research Laboratory can render a unique service. Here, the men who were largely responsible for the basic development of modern dental gold alloys are thoroughly familiar with the symptoms accompanying a wide variety of abnormalities. When your gold problem is presented they have every facility to make a complete diagnosis, no matter how deep they may have to dig for the facts. And you will get a simple and conclusive answer . . . promptly. Detailed trouble-shooting reports are frequently illustrated by one or more photomicrographs similar to the one on the opposite page.

This service is free and very readily available, either by direct correspondence with our Research Director, Mr. Richard L. Coleman, or by referral to the Ney Technical Representative in your locality.

THE J. M. NEY COMPANY • HARTFORD 1, CONNECTICUT

Born of Research
Proved by Test

NEY-ORO & PALINEY CASTING GOLDS ●
DENTURE-CLASP WIRE ● NEY-ORO ELASTIC & PALINEY WIRES ●
THE NEY WING BAR AND FINISH LINE CLIPS ● NARRO-STRIP SOLDERS
NEY ROD SOLDERS ● ZEPHYR PLATE, SHELLS & FOIL ● THE WAXING DIE
THE NEY SURVEYOR

IMPRESSION TRAY COMPOUND

The original black, moderate-heat impression compound for making individual impression trays for use with impression paste, plaster washes, etc. Complies with A.D.A. Specification No. 3 for Type 2 Impression Compounds.

ELASTIC COLLOID

For accurate one-piece impressions, regardless of difficulties such as severe undercuts. The accuracy of the impression is maintained indefinitely, hence the impression can be poured at the convenience of the operator. Complies with A.D.A. Specification No. 11.

NO INVOLVED TECHNIQUES

S. S. White Impression Materials are easily worked and reproduce cleanly and sharply, every detail of the oral structure. Each is of uniform texture, hence working qualities are uniform. Meeting all the requirements for precise impression-taking, their outstanding merits contribute effectively to better dentistry.

THE S. S. White DENTAL MFG. CO.,

OVER A CENTURY OF

White IMPRESSION Materials

UNEXCELLED FOR TISSUE ACCURACY

Getting an exact impression is the necessary initial step for obtaining the perfect fit of a prosthetic restoration; and getting an exact impression is facilitated if you use materials best suited for the task at hand.

For correcting full impressions under equalizing pressure without tissue distortion.

IMPRESSION PASTE

A quick-setting, low working-temperature compound. Complies with A.D.A. Specification No. 3 for Type 1 Impression Compounds.

EXACT
IMPRESSION COMPOUND

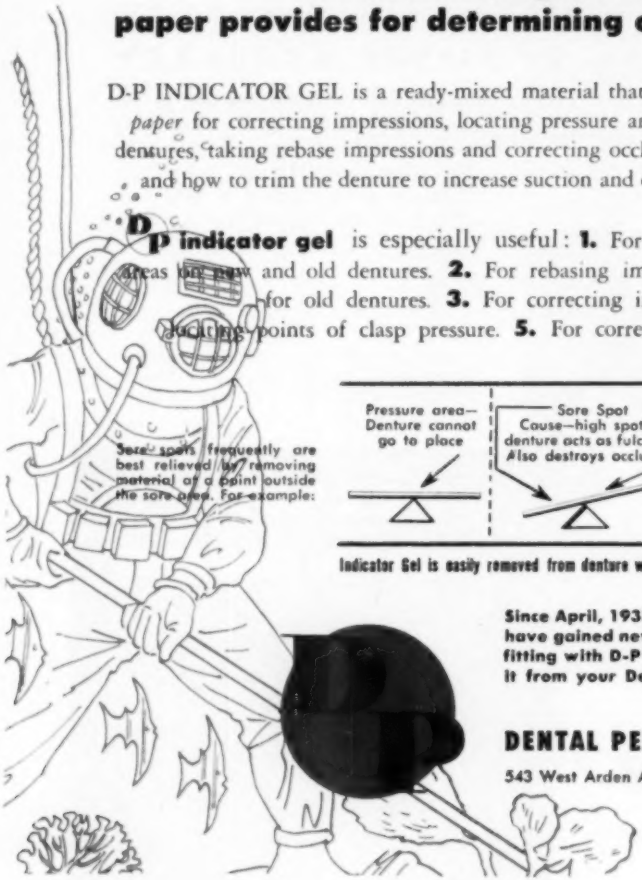
Philadelphia 5, Pa.

SERVICE TO DENTISTRY

assures you the confidence in denture fitting that articulating paper provides for determining occlusion

D-P INDICATOR GEL is a ready-mixed material that acts as a *tissue carbon paper* for correcting impressions, locating pressure areas on full or partial dentures, taking rebase impressions and correcting occlusion. Indicates where and how to trim the denture to increase suction and eliminate sore spots.

D P indicator gel is especially useful: **1.** For correcting pressure areas on new and old dentures. **2.** For rebasing impressions for old dentures. **3.** For correcting impressions. **4.** For locating points of clasp pressure. **5.** For correcting occlusion.



Sore spots frequently are best relieved by removing material at a point outside the sore area. For example:

Pressure area—Denture cannot go to place
Sore Spot Cause—high spot in denture acts as fulcrum. Also destroys occlusion
Remove this and denture fits. Eliminating high spot also corrects occlusion

Indicator Gel is easily removed from denture with water and D-P Laboratory Solvent

Since April, 1933, thousands of dentists have gained new confidence in denture fitting with D-P INDICATOR GEL. Order it from your Dental Dealer.

DENTAL PERFECTION CO.

543 West Arden Ave., Glendale 3, Calif.

For EVERY TECHNIQUE

• For any pattern carved by the direct method, dentists have learned there's no other wax like Kerr Blue Inlay.

In this most severe test, Kerr Blue carves easily, sharply—without chipping. A true pattern every time!

Other techniques naturally find Kerr Blue performance similarly outstanding. Leadership—for good cause!

Whatever your technique, standardize on Kerr Blue for every inlay wax need.

KERR MANUFACTURING CO.

Detroit 8 • *Established 1891* • Michigan

Supplied in Kerr Hard Blue Inlay Wax and Kerr Regular Blue Inlay Wax.

Add 5 to 10 years

to your professional life . . . profitably . . . comfortably

with ROTA-SEAT

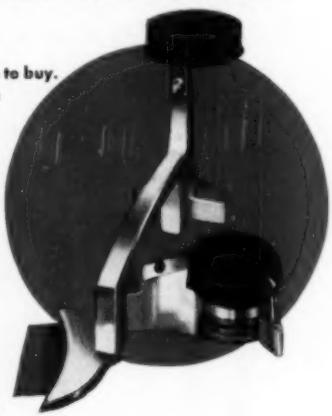
Rota-Seat gives you complete operating freedom—SITTING DOWN. It will add years, profitable years, to your professional career, because when you work sitting down you banish exhaustion, backache, bending and twisting stresses that can build up to serious organic disorders. You can take care of more patients, too, for you will need fewer rest periods.

Rota-Seat is a real operating seat, you sit on deep, foam rubber, and roll easily to any operating position. More and more dental colleges are endorsing Rota-Seat's "sit-down" technique every day —send for fully illustrated booklet showing how to combat fatigue and live longer—the Rota-Seat way.

Ask your dental supply dealer to show you how easy it is to operate from a Rota-Seat in *your* office. Thousands of satisfied users.

BASIC FEATURES:

- **Foot control switch ALWAYS moves when you do.**
- **Use your regular equipment—nothing else to buy.**
- **Rota-Seat is always there—it can't push away from the chair.**
- **Day long comfort—no lost motions —stand instantly when necessary.**
- **No change in your technique—no loss of leverage—you actually work closer to patient—your hands are always free.**
- **Feel better—work better—get new operating comfort with ROTA-SEAT.**
- **ROTA-SEAT is the ORIGINAL operating seat for dentists— (not merely a rest stool)**



rota-seat INC.

DENTAL EQUIPMENT SPECIALISTS

4606 W. 21st St. Cicero 50, Ill.

For all surgeons who have occasion to treat injuries of the face

THE SURGICAL TREATMENT OF FACIAL INJURIES

By Varaztad Hovhannes Kazanjian, M.D., D.M.D., ***Professor Emeritus of Plastic Surgery, Harvard University***
and John Marquis Converse, M.D., ***Assistant Professor of Clinical Medicine, New York University College of Medicine***

Doctors Kazanjian and Converse have had a combined experience of 53 years in treating facial injuries, including four years in France in the First World War, and six years in England, North Africa, Italy and France in the Second World War. They have seen and treated many thousands of cases, and now they draw upon this vast and varied experience to present their viewpoint in the surgical treatment of injuries of the face.

The emphasis in the text is on general principles of procedure, illustrated with graphic descriptions of actual cases. Operative technics are minutely described with line drawings to emphasize the various steps. The first three chapters comprise a brief survey of the evolution and anatomy of the human face, and a general discussion of the healing of wounds and principles of operative technic. Treatment of fractures of bones of the face is thoroughly covered, as are deformities and reconstructive surgery of the soft tissues. Facial prostheses are given due consideration, and a chapter on special aspects of anesthesia is included.

574 pp., 746 figs., 3 in color, $10.00

THE WILLIAMS & WILKINS COMPANY

25th Anniversary Year 1925-1950

Mt. Royal and Guilford Aves. Baltimore 2, Maryland

INSURANCE

ACCIDENT • HOSPITAL • SICKNESS
For Dentists, Physicians, Surgeons Exclusively

ALL PREMIUMS COME FROM — PHYSICIANS SURGEONS DENTISTS — ALL CLAIMS GO TO

Cost has never exceeded amounts shown

$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	**$8.00** Quarterly
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	**$16.00** Quarterly
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	**$24.00** Quarterly
$20,000.00 ACCIDENTAL DEATH $100.00 weekly indemnity, accident and sickness	**$32.00** Quarterly

ALSO HOSPITAL EXPENSE FOR MEMBERS, WIVES AND CHILDREN

85c out of each $1.00 gross income used for members' benefit

$3,500,000.00
INVESTED ASSETS

$16,000,000.00
PAID FOR CLAIMS

$200,000.00 deposited with State of Nebraska for protection of our members

Disability need not be incurred in line of duty—benefits from the beginning day of disability

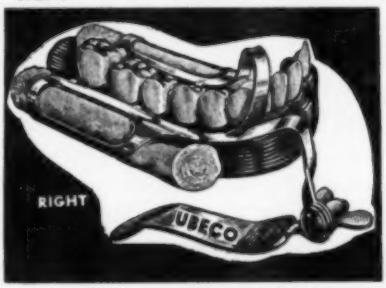
PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

47 years under the same management

400 FIRST NATIONAL BANK BUILDING — **OMAHA 2, NEBRASKA**

INDIAN HEAD

CHILD'S SIZE COTTON ROLL HOLDERS



For use during Sodium Fluoride Treatments

Children's Size	$ 5.00
Adult Size	5.00
Child Size with Saliva Ejector	10.00
Adult Size with Saliva Ejector	10.00

Sold by Better Dealers Everywhere

Manufactured by

UNION BROACH CO., Inc.

37 West 20th St. Dept. A-1 New York 11, N. Y.

COMIC RUBBER MOLDS

No. 9—Mickey Mouse and 5 Others.
No. 15—Bambi, Dumbo, Goofy and 3 Others.
No. 16—Wizard of Oz (6 Characters).
No. 6—Soldier Set—5 Characters.
No. 8—Circus Set—6 Characters.

No. 2A—Indian Tribe Set—6 Characters.
$3.75 a set

No. 19—Pirate Set—7 Characters.
$5.00 a set

Sold by Better Dealers Everywhere

UNION BROACH CO., INC.

37 West 20th Street — **Dept. A-1** — **New York 11, N. Y.**

NEW TICONIUM

"Preview" MODELS!

Now you can show your patients that Ticonium case before it's made! These attractive models (on which the case is dramatically painted) let the patient SEE! Simple, quick, yet permanent — that's why hundreds of dentists who have seen Ticonium "PREVIEWS" say they are the best convincers they've ever seen.

"PREVIEW" Models are available only at your Ticonium Laboratory!

Another FIRST for dentistry by TICONIUM

Another MOSBY book!

Basic Principles and Technics

for

COMPLETE DENTURE CONSTRUCTION

By VICTOR H. SEARS, D.D.S., formerly Professor of Prosthetic Dentistry, New York University. Certified by the American Board of Prosthodontics.

416 pages, illustrated. **PRICE, $5.00**

Widely known as a lecturer in practically every state, Dr. Sears has made important contributions to dental literature in his magazine articles and other books.

This newest work is a combination of "Basic Principles in Dentistry," "Prosthetic Papers," (Both out of print) and a manual which he wrote in Spanish, together with some more recent findings. It covers the subject in minute detail and will serve as an invaluable work guide on complete denture construction.

Beginning with the aims in artificial denture construction, the text covers materials and equipment, structures involved; principles of impression making; making of casts, jaw motions and their recording; principles in mounting casts on the articulator; principles of selecting anterior teeth; occlusion as a basis for selecting posterior teeth; principles of occlusion; principles of denture processing; principles of remodeling and rebasing; and immediate denture construction.

ORDER FORM

ADA 1-50

The C. V. Mosby Co.
3207 Washington Blvd.
St. Louis 3, Missouri

Please send me a copy of Sears' Basic Principles and Technics for COMPLETE DENTURE CONSTRUCTION. ($5.00)

☐ Enclosed find check. ☐ Charge my account.

Name .....

Address .....

Does your X-Ray equipment reflect your professional prestige?

Take a look at your dental x-ray equipment. Maybe it needs replacing with a new, beautifully styled General Electric CDX. The kind of equipment found in top dental offices everywhere. And no wonder, for the GE unit is modern, safe and shock-proof. Fully protected against stray radiation. So simple to operate, too, and so easily accessible. Ask your dealer to show you specifically how the CDX can help to make your office more inviting — more attractive, or write direct to General Electric X-Ray Corporation, Dept. JJ1, Milwaukee 14, Wis. Remember, an up-to-date office is your best public relations!

GENERAL ELECTRIC
X-RAY CORPORATION

CLASSIFIED ADVERTISING

Forms close on 25th of second month preceding month of issue

Remittance Must Accompany Classified Ads.

Advertisements cost $3.50 not exceeding 30 words, additional words 10c each. Commercial agency advertisements, $3.50 for 20 words, additional words 13c each. Publisher reserves the right to determine classification. An extra fee of 25c is charged advertisers who have answers sent care of A.D.A. and in such cases we do not furnish name or address to inquirers. This rate applies for each insertion.

PRACTICES FOR SALE

FOR SALE—Due to death, Florida practice in large city; established twenty years. Excellent location. Complete, modern office, three chairs, air compressor, Castle light and fully equipped laboratory. Price reasonable. Terms. Address A.D.A. Box 95.

•

FOR SALE—Exceptional bargain; well established dental office, 529 Market Street, Camden, New Jersey. Reception room furnished in chrome and leather, modern dental equipment, business office furnishings. Address replies to Dr. R. R. Paletz, 350 Lincoln Road, Miami Beach, Florida.

•

FOR SALE OR RENT—Due to illness, fully equipped and furnished two-chair dental office. Building includes attractive second floor apartment for use or income. Complete X-ray and laboratory. Convenient central location serving large clientele for over fifty years. Moderately priced; terms available. Address Mrs. Edward S. George, 219 S. Huron, Ypsilanti, Michigan.

•

FOR SALE — Florida dental office, latest Ritter equipment; dental unit, chair American cabinet (ivory finish); also X-ray, laboratory, business office, modern reception room furniture. Reasonable rent, professional building, West Palm Beach. Address A.D.A. Box 102.

•

FOR SALE—Completely furnished two-chair dental office in wealthy Northern Illinois farming community. Late owner in practice over 30 years. Very low rent. Full price $1200.00. Address replies to Herbert Dakin, 204 W. La Rue Street, Streator, Illinois.

•

FOR SALE—Busy dental practice Northeastern Pennsylvania. Newly renovated office in the heart of Pennsylvania fishing and hunting country. Operating room, waiting room, private office, dark room and laboratory. Low rental. Address A.D.A. Box 103.

•

FOR SALE — Well established practice. Equipment is clean and serviceable. Includes new Weber X-ray. One-chair office located in bank building in Iron Mountain, Michigan. Address A.D.A. Box 104

•

FOR SALE — Sacrificing well established and newly equipped dental office, grossing $17,000 annually, for actual value of equipment. Medium sized Minnesota community. A real opportunity. Address A.D.A. Box 105.

FOR SALE—Because of ill health, practice established 25 years in town of 10,000. New Ritter equipment, motor chair, unit, etc. X-ray, American cabinet, chrome furniture, laboratory, dark room equipment and instruments. Low overhead. Will sacrifice for $2000.00. Address replies to Dr. W. R. Middleton, Andalusia, Alabama.

•

FOR SALE—Busy practice, very modern, attractive and complete office; latest Ritter equipment. Take over ten-year lease, plus inventory; perfect location, excellent climate beautiful valley. Reason: heart condition necessitates enforced rest, but will remain to assist buyer in every way, if desired. Address replies to Dr. D. L. Prows, Box 829, Lake Elsinore, California.

PRACTICES WANTED

WANTED—Dental practice; Dentist wishes to purchase or become associated in active, well-established practice in New York State, Connecticut or Massachusetts. Address A.D.A. Box 106.

LOCATIONS AVAILABLE

FOR SALE—Splendid one-story office. Town of 1600. Ideal location for dentist or M. D. For particulars write R. E. Orr, Decatur, Michigan.

•

FOR RENT—Space and equipment, in a well established, well equipped office in an excellent location, to a man of the highest qualifications only. Southern California. Address A.D.A. Box 107.

•

FOR SALE—Nebraska dental office, completely up-to-date; new Ritter motor chair unit and X-ray, also S. S. White chair. Office rent, including heat, $15.00 monthly. Only dentist in town. Address A.D.A. Box 108.

•

FOR RENT—Dental office, common waiting room with general practitioner. Ideal location and lucrative practice previously established. Address replies to H. J. Sliski, M. D., 1040 W. Genesee St., Syracuse, N. Y., Phone 3-5370.

•

FOR RENT—Three room professional suite; suitable for dentist or physician; in established physician's office; waiting room furnished. Philip Shulman, M. D., 308 Chestnut Street, Roselle, N. J.

OPPORTUNITIES AVAILABLE

WANTED — By philanthropic foundation, dentists under 40 years of age for public health work. Starting salary rate, $4500.00 per annum. Michigan licensure not required provided the individual is a graduate of an accredited dental school and is licensed in another state. For detailed information write Kenneth R. Gibson, D.D.S., M.S.P.H., Director, Child Health Division, Children's Fund of Michigan, 660 Frederick Street, Detroit 2, Michigan.

•

WANTED—Dentist for Mississippi State Penitentiary. Salary $4800.00 yearly. House and utilities, also partial maintenance furnished. New hospital—well equipped dental unit. Applicant must be under forty years of age. Write M. E. Wiggins, Superintendent, Mississippi State Penitentiary, Parchman, Mississippi.

•

WANTED—Dental Educator for city public health department, preferably with elementary school teaching and dental hygienist experience. Present salary range $220 to $265 per month; automatic salary increases; semi-annual cost-of-living salary adjustments; $25 per month mileage allowance; state-wide retirement program. For details write to Personnel Division, City Hall, Madison 3, Wis.

•

WANTED—Dentist, at once, in Oklee, Minnesota. Three rooms ready in new, modern medical clinic building with radiant heat. Share waiting room with M. D. Excellent territory open now. Personal interview preferred or write Joe Dufault, secretary, Oklee Community Hospital Association, Oklee, Minn.

•

WANTED—Dental Hygienist. Position available soon. Salary and commission. Address replies to Dr. L. Riley McCormick, 2609 University Avenue, Madison 5, Wis.

•

WANTED—Dental Intern, beginning July 1, 1950. Training in Anesthesia, Radiography, Oral Surgery, Exodontia, etc. Applicants must be graduates of accredited dental schools. Address Executive Director, Sinai Hospital, Baltimore 5, Maryland. (Approved by A.D.A. Council on Hospital Dental Service.)

•

WANTED—Dentist, to become associated with two physicians in clinic type practice. Chair and X-ray available. Toledo, Ohio. Address A.D.A. Box 89.

•

WANTED—Young Dentist. Wonderful opportunity. Prosperous community, three others within seven mile radius, 2000 school children. Modern house available, living and office quarters. For details write Mrs. Germaine Roch Long, Unity Farm, Summerfield, N. C.

SITUATIONS WANTED

Representative residing in Switzerland desires connection with manufacturers of the dental line who are interested in export to Switzerland and France. Commission. Address A.D.A. Box 109.

•

Young dentist, veteran, B.S., D.D.S., seeks association or will purchase practice; year's internship and year of private practice: New York license. Address A.D.A. Box 110.

Dental technician, 20 years experience in dental office, seeks position with dentist sufficiently interested in laboratory work to cooperate closely with him. Address A.D.A. Box 111.

EQUIPMENT FOR SALE

FOR SALE—Used dental office equipment and furniture. Complete and priced right for individual or institution where used equipment would suffice. Inquire Trust Department, Alliance First National Bank Alliance, Ohio.

MISCELLANEOUS

WANTED—Old Dental Books—Orthodontia Journals; Old Dental Prints — Advertisements. Leo L. Bruder, 1 DeKalb Avenue, Brooklyn, N. Y.

AGENCIES
OPPORTUNITIES AVAILABLE

(a) Pedodontist to become associated with three dentists; university town of 125,000, Middle West. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(b) Public health dentist to direct state program of dental health education; $6600-$7800. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(c) Dentists qualified in teaching for departments of operative dentistry and crown and bridge; West. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(d) Orthodontist to become associated with group clinic; town, 60,000, Texas. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(e) Pedodontist to become associated with dentist having large general practice; town of 100,000, Middle West. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(f) Senior dentist; state hospital; salary includes complete family maintenance, either home or apartment. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(g) Orthodontist to become associated with eight-man clinic operating own hospital; East. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(h) Pedodontist and, also, outstanding operator in general operative procedures; group appointments; California. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(i) Public health dentist qualified in public health dentistry to direct dental health program for children. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(j) Dentist to take charge of clinical services in large hospital and, also, dentist to conduct county health dental program; California. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

(k) Public health dentist to direct program for children enrolled in public schools; university town, Southeast. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(l) Michigan-licensed dentist; group association; percentage basis. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(m) Dentist to join department of dentistry, health department, public schools; Indiana. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(n) Experienced young dentist, become associated dentist well established Southern California. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(o) Dentist to become associated with small group; general practice; Northwest Texas; $700. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(p) Pedodontist to become associated with dentist, general practice; university town, Middle West. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(q) Full-time dentist; state hospital; $4200, family maintenance; staff quarters recently completed. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(r) School dentist; mining community of southeast state; mobile unit; $6000. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(s) Dentist to become associated with new clinic and hospital in South Dakota; salary or percentage providing excellent income. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(t) Dentist; group appointment; general practice with emphasis on crown and bridge pedodontics; Ohio. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

TECHNICAL ASSISTANTS

(a) Dental hygienist; dental clinic of large industrial company; Middle West. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(b) Dental hygienists qualified in teaching; school for hygienists being inaugurated by university. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(c) Hygienist; dental group well established in California. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

(d) Dental hygienist; public health department; Middle West. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

SITUATIONS WANTED

Young dentist is available for assistantship or group appointment in general dentistry; B.S., D.D.S., Middle Western university; two-year internship; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

Dentist seeks administrative position in dentistry or related field, interested, also, education, research; B.A., D.D.S. degrees; considerable work toward MPH; two years, public health dentistry; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

Dentist is available for academic appointment; eight years, head of undergraduate full denture department in university dental school; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

Dentist seeks institutional dentistry; B.S., D.D.S. degrees; teaching experience; three years, resident dentist, state hospital; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

Oral surgeon; B.S., D.M.D., state university; three-year fellowship in oral surgery for which he received M.S. degree (Dental Surgery); eligible for American Board, Oral Surgery, 1951; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

Young dentist; D.D.S., state university; five years, staff member, university student health department; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

Orthodontist — D.D.S., eastern university; now completing graduate training for M.S. degree; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

•

Pedodontist; B.S., D.D.S., state university; year's internship, hospital for children; teaching experience (oral diagnosis); several years private practice specializing in children's dentistry; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building Chicago.

•

Public health dentist; eight years, private practice of general dentistry, simultaneously serving as director, dental clinic, public schools; two years, public health dentistry for children, state department of health; for further information, please write Burneice Larson, Medical Bureau Palmolive Building, Chicago.

•

Young periodontist; B.S., D.D.S., M.A. degrees, eastern university; six years, general practice with some specialization in periodontia; five years, dental officer with U.S.V.A.; past year, clinical research in periodontia; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

INDEX TO ADVERTISEMENTS

December 1949

Abbott Laboratories A-6
American Dental Association A-4, A-15, A-16, A-30, A-60
American Sterilizer Co. A-7
Austenal Laboratories A-32, A-33

Bard-Parker, Inc. A-2
Boos Laboratories, Henry P. A-10
Bristol Myers Co. A-11, A-17

Carrier Corp. A-21
Castle, Wilmot A-26
Caulk Co., The L. D. A-31, A-58
Childs Mfg. Co. A-39
Church & Dwight Co., Inc. A-9
Classified Advertising A-54, A-55, A-56
Coe Laboratories A-40
Columbia Dentoform Corp. A-12
Columbus Dental Mfg. Co., The A-24
Colwell Publishing Co. A-8
Cook-Waite Laboratories ..... 3rd Cover
Corega Chemical Co. A-13
Crescent Dental Mfg. Co. A-20

Dee Division, Handy & Harman A-1
Dental Perfection Co. A-46
Dentists' Supply Co. of New York ..... 2nd and 4th Covers
Durallium Products Corp. A-29

General Electric Co., Chemical Division A-25
General Electric X-Ray Corp. A-53

Hygienic Dental Rubber Co. A-14

Jelenko & Co., J. F. A-38
Johnson & Johnson A-8, A-35

Kerr Mfg. Co. A-47
King's Specialty Co. A-20
Konformax Division, Permatex Co. A-22

Medical Protective Co. A-14
Merck & Co. A-19
Mosby Co., The C. V. A-52
Myerson Tooth Corp. A-28

National Dairy Council A-5
Ney Co., J. M. A-42, A-43
Novocol Chemical Mfg. Co. A-41

Parker Co., A. J. A-35
Pelton & Crane Co. A-3
Pfingst & Co., Inc. A-34
Physicians Casualty & Health Assn. A-50

Ritter Co. A-59
Rota-Seat, Inc. A-48

Ticonium A-51

Union Broach Co., Inc. A-50
U. S. Army & U. S. Air Force A-18

Wernet Dental Mfg. Co. A-36, A-37
White Dental Mfg. Co., The S. S. A-44, A-45
Whitehall Pharmacal Co. A-23
Williams & Wilkins Co. A-49
Wilmot Castle Co. A-26

Year Book Publishers, Inc., The A-27

travel where you will

you'll

find

leading

dentists

using

Caulk

KADON

the new, quick-curing,
tooth-matching resin
for restorative dentistry.

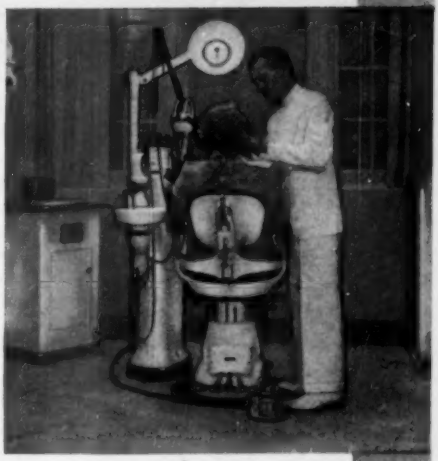
For modern materials call on CAULK Milford, Delaware

Ritter GIVES YOU

2 DISTINCTLY DIFFERENT UNITS

MODEL "F"

MODEL "E"



WITH Ritter you select the unit best suited for your technique. The Ritter Model "E" is a compactly built unit with all operating instruments, air, water, waste, vacuum and gas within arm's reach for dentists who prefer a single unit. Many dentists find the divided style Model "F" Unit, with all instruments right at hand, easier to operate, seated or standing . . . no reaching across patient.

The same exclusive Ritter features are yours with a model "E" or "F" Unit. A complete set of low voltage instruments, angled properly for easy grasp, are all within arm's distance. A bracket table in 3 different heights is available for each unit. The silent Ritter engine gives the greatest range of speeds at the handpiece 1000-6500 r.p.m. *All regulated by the foot controller.* The exclusive Ritter Ful-Vue light gives balanced illumination—a concentrated beam for oral cavity work, general illumination for the entire operating area. Ask your dealer for a demonstration of the many advantages of these two Ritter Units.

SELECT THE RITTER UNIT BEST SUITED TO YOUR OPERATING TECHNIQUE

Ritter
COMPANY INCORPORATED
BUILT UP TO A STANDARD NOT DOWN TO A PRICE
RITTER PARK, ROCHESTER 3, N.Y.

WRITE FOR YOUR COPIES OF THE REVISED PRACTICE BUILDERS

LET'S DOUBLE IT IN '49!

How much MORE can YOU give . . . *comfortably*?

The Annual Christmas Seal Campaign of American Dental Association Relief Fund is underway. If you can double your contribution of last year—comfortably—it will go a long way toward bringing—not comfort—but the bare necessities of life to the many deserving dentists who have been forced to call on the Relief Fund.

THE NEED IS GREATER

This year's applications for relief grants are running three times higher than last year's. And last year's contributions did not quite meet the amount of total grants paid out. More is needed.

The A.D.A. Relief Fund, you know, acts in conjunction with your state dental society, which automatically receives one-half of your contribution. The A.D.A. Fund pays two-thirds of each grant—your state society pays the other one-third. Your contribution spreads itself through forty-eight states and saves a big portion for your needy fellow dentists close to home. It does go far . . . and near!

Send your contribution today to the American Dental Association Relief Fund, 222 E. Superior St., Chicago 11, Ill.

BACK AGAIN!
"Sure——
MY dentist doesn't hurt!"
Such confidence in a patient is a heartening sight, indeed — and a tribute to his dentist's thoughtfulness. That this patient is not afraid is also a tribute to Novocain-Pontocaine-Cobefrin, for it's because of "N.P.C.'s" deep, dense, lasting action that our cowboy friend is free of fear.
Elimination of dental pain by any means is well worth while . . . but what simpler, more economical way than by use of this fine local anesthetic solution? Used wherever and whenever indicated, "N.P.C." effectively controls dental pain. On your ability to exercise such control depends better dental health for your patients — and a better, more satisfying practice for you.
COOK-WAITE Laboratories, Inc.
1450 BROADWAY
NEW YORK 18, N. Y.
Cobefrin, Novocain, Pontocaine Reg. Trademarks Winthrop-Stearns, Inc.
npc
"the Difference is Distinctive"

Attractive dentures build appreciative patients

A TRUBYTE NEW HUE DUPLICATE of this patient's natural teeth: Centrals — 1R. Laterals — 324. Cuspids — 1Y. Lowers — Mould 44. Shade 62 was an accurate match.

You create more attractive dentures whenever you use your Trubyte New Hue Mould Guide and your Trubyte New Hue Selector Assortment.

With your Trubyte New Hue Mould Guide you quickly observe the effect produced by using different moulds and arrangements of teeth and by interchanging laterals or cuspids from other moulds than the centrals. With your Trubyte New Hue Selector Assortment you choose the shade that is appropriate to the patient's age and complexion.

For the best results all the time specify...

TRUBYTE NEW HUE®

Also in Trubyte New Hue Forms and Shades

TRUBYTE ACRYLIC TEETH

THE DENTISTS' SUPPLY COMPANY OF NEW YORK